May, 1957 Vol. 46 No. 5

INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

The Shop Teachers' Professional Magazine

REQUISITION NUMBER

It reaches far into the future

The Lake Pontchartrain Causeway is essentially a very long concrete bridge. Unlike other bridges, however, the concrete was *not* poured on location. It might almost be said this new monster was built on dry land and then erected where it was wanted. Thousands of precast prestressed concrete spans were assembled in just that manner. This new technique not only avoided the many difficulties and hazards inescapable with former construction methods, but it resulted in an economy in construction time and costs which will reach far into the future. Countless weeks of time and millions of dollars will thus be saved in building thousands of future highway bridges.

This story is typical of the American engineer and the products of his creative genius. But where does this genius come from? History shows us it is *not* hereditary. Distinguished engineers both past and present in most cases came from average homes. As youths they didn't act or react any differently than the lads who crowd our classrooms today. This creative genius, the spark of achievement, slumbers in every lad. Whether this spark is fanned into a flame before it is smothered decides the student's future. Time and time again, instructors of mechanical drawing have witnessed the awakening of this inner genius. Here the student discards his boyish fancies for the practical and achievable. For the first time he learns the meaning of precision craftsmanship. He begins to think analytically and to use sound judgment. During these formative days, impressions are indelible . . . good and bad. For this reason the student's drawing instruments should be selected with exacting care. Drawing instruments are basic tools of every engineer, and inferior tools will never inspire skilled workmanship. Drawing instruments are a lifetime possession, and the only instruments worthy of consideration are the very best the student can afford. Precision inspires precision...perfection inspires perfection.

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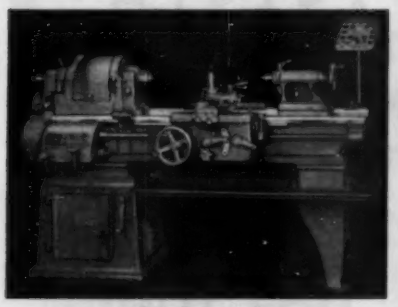
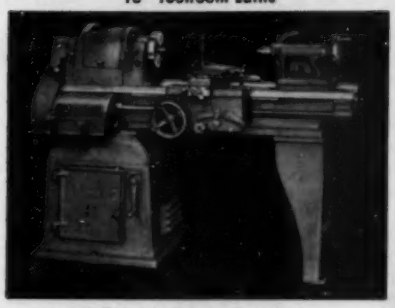
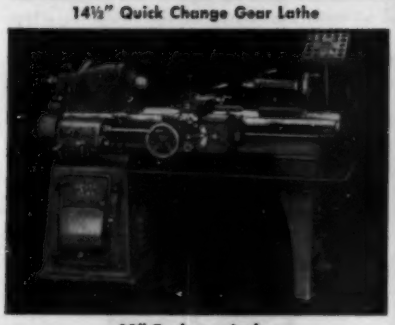


16" Toolroom Lathe



14½" Quick Change Gear Lathe



13" Toolroom Lathe

10" Quick Change Gear Lathe

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Light Ten Model B Bench Lathe

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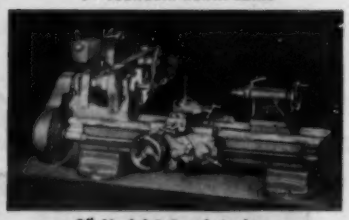
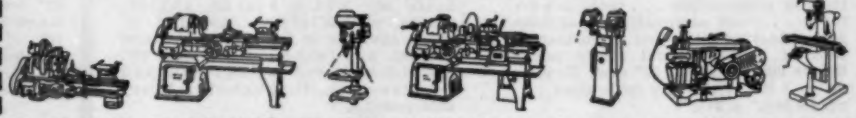
9" Toolroom Bench Lathe



9" Model B Bench Lathe

9" Model C Bench Lathe

PLEASE SEND INFORMATION CHECKED:



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MAY
1957

VOL. 46 NO. 5

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

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☆ ☆ ☆

This Month's Cover

The picture on this month's cover shows Donna Petersen, a student in the industrial-arts department at Cottonwood High School, Cottonwood, Ariz., at work on the rifle scabbard she made in the leathercrafts course.

Her instructor is Stan Schirmacher, who made the photograph and sent it to us.

☆ ☆ ☆

Summer School

If you are planning to make arrangements to attend summer school this year, do not delay too long, because classes may be overfilled before your application arrives.

A fine list of teacher education institutions offering summer school programs appears on page 157 of this issue.

☆ ☆ ☆

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CONTENTS

Industrial Arts Inventory and Purchasing.....*Jules Bertin* 143
Industrial Education in Harford County, Md.....*John R. Walker* 145
Industrial Arts in the Education of Delinquents
.....*Norman W. Bedwell* 148
Industrial Arts and Consumer Education.....*Garfield Burnham* 149
Reproduction of Shop Drawings — Part II.....*Lawrence S. Wright* 151
Potentialities of a Pupil Personnel Organization
.....*Donald G. Lux* and *Edward R. Towers* 152
Open House for the Faculty.....*John A. Hielsberg* 156

Editorials:

Requisition Time 157
Aristocratic Bricks..... 157
Summer School Offerings..... 157

Problems and Projects

A New Experiment for Industrial Arts.....*Alexander F. Bick* 158
Golf Bag Cart.....*Byron E. Graber* 160
A Record Player for the General Shop
.....*M. D. Roberts* and *W. O. Satterley* 163
Name Plate.....*Waldemar E. Klammer* 167
Copper Enameling by Air-Acetylene Torch.....*Peter T. McKinney* 168
A Bench Hook.....*Filmore Gluck* 170
Pocket Saver.....*Arthur O. Berry* 171
Correction — Metalworking Shop Equipment List..... 171
Mealtime Accessory.....*Jos. J. Lukowitz* 171
Music Stand.....*Herbert W. Yankee* 173
Checking Out Bulletin for Teachers.....*John F. Donovan* 173
Organization — The Key to Good Student Discipline...*Fred A. Olsen* 174
National Science Foundation Grants Awarded..... 20A
Outside-of-School Industrial Arts Assignments.....*Bernard Wray* 32A
Specifications for Metal Lathing and Furring..... 32A
The Need for New and Better Engineering Talent..... 34A

Association News..... 4A
Personal News..... 22A
News Notes..... 34A
New Publications..... 43A
Business and Personal News..... 48A
Descriptive Material..... 49A
Shop Equipment News..... 54A

Association News

COMING CONVENTIONS

Apr. 23–26. American Industrial Arts Association, at Hotel Muehlenbach and Municipal Auditorium, Kansas City, Mo. Secretary, Kenneth W. Brown, Box 2350, Buffalo 23, N. Y.

Apr. 27. Virginia Council of Industrial Education Clubs, at George Washington High School, Alexandria, Va. Secretary, Albert R. Connors, Newport News High School, Newport News, Va.

May 1–2. New York State Steering Committee for Industrial Arts, at Powers Hotel, Rochester, N. Y. Secretary, Robert Ullery, 42 Blauvelt Road, Blauvelt, N. Y.

May 2–4. New York State Vocational and Practical Arts Association, at Powers Hotel, Rochester, N. Y. Secretary, Reno Knouse, Teachers College, Albany, N. Y.

May 9–10. Oswego Industrial Arts Spring Conference, at New York Teachers College, Oswego, N. Y. President, Arthur Hauler, Teachers College, Oswego, N. Y.

May 9–11. Wisconsin Association for Vocational and Adult Education, Secretary, C. D. Rejahl, c/o Commercial State Bank Bldg., Room 211, Madison, Wis.

June 3–7. Wyoming Vocational Agriculture Teachers Association, at Laramie, Wyo. Secretary, Wayne Lynn, Byron, Wyo.

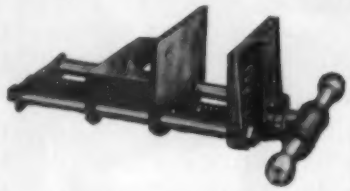
June 12. Minnesota Vocational Agriculture Instructors Association, at Moorehead, Minn. Secretary, Mike Cullen, Willman, Minn.

June 13–14. Georgia Vocational Association, at Atlanta, Ga. Secretary, R. F. Greeson, State Office Bldg., Atlanta, Ga.

June 15. National Council of Technical Schools. Secretary, H. E. McCallick, Chicago Technical College, 2000 So. Michigan Ave., Chicago 16, Ill.

Whatever Your Need in Vises, See Morgan First

SOLID NUT CONTINUOUS SCREW VISE



Simplicity of construction insures service under the most severe wear. Interchangeable cold rolled side bars threaded and held in place by hexagon nuts — not riveted. Stop in front jaw.

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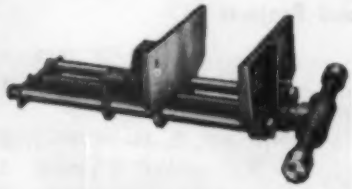

Most simple and effective of the screw adjusting type vises. Intercepted threads on the screw operate in a half nut. Offers speedly gripping power. High quality bronze half nut. Carefully machined working parts.

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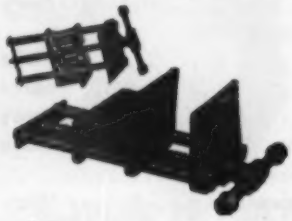

Combines the speed and convenience of the rapid action vise and the smooth positive action of the continuous screw vise! All semi-steel castings machined to close tolerances. Operates on a new floating nut. Adjustable stop in front jaw.

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FLORIDA INDUSTRIAL ARTS ASSOCIATION

The annual business meeting of the Florida Industrial Arts Association was held on March 14, 1957, at the University of Tampa.

The program for the day included an officers' meeting, followed by registration and open house in the industrial-arts shop, and luncheon at the University Cafeteria.

The invocation was given by Dr. Walter R. Williams, Jr., director of vocational and adult education, University of Tampa.

Welcoming addresses were given by Dr. Elwood Nance, president, Tampa University, and Dr. Doak Campbell, president, Florida State University, followed by greetings from Professor James Bignell, head, industrial-arts department, University of Tampa.

After the introduction of guests by Ed Sinic, vice-president of the Florida Industrial Arts Association, a "Report on Safety in Florida Industrial Arts Education" was presented by John Tammeryn, supervisor, industrial arts, and safety director of Hillsborough County.

At the afternoon meeting Charles R. Crakes, educational consultant, DeVry Technical Institute, spoke on "Technological Opportunities for Youth." After this a state report was presented by Dr. Ed Kurth, state consultant for industrial arts.

The business meeting for members and guests included the minutes by Dave Richards, secretary-treasurer; new and old business; reports by the vice-president; and election of officers.

The new officers are Bernard Kurland, president; Dean Rickey, vice-president; and Bill Brawn, secretary. — *Bernard Kurland.*

INDUSTRIAL ARTS WORKSHOP HELD

On Friday and Saturday, February 8 and 9, an Industrial Arts Workshop was held at St. Cloud State Teachers College, St. Cloud, Minn.

The workshop was sponsored by the Central Minnesota Industrial Arts Association and St. Cloud State Teachers College. Dr. Ray Larson was director of activities.

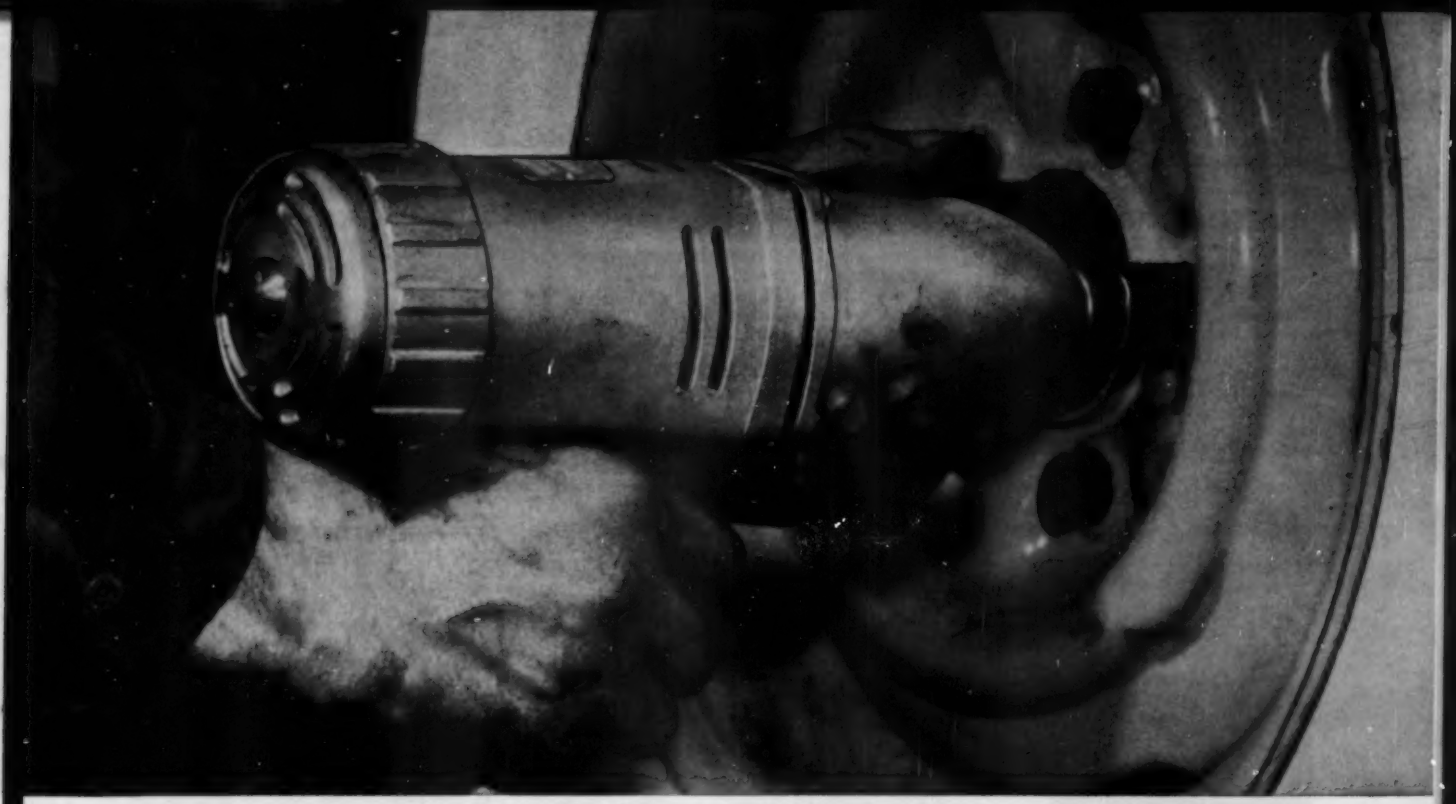
Dr. Clugston, dean of academic instruction at the college, welcomed the group. Demonstrations were given in Fiberglas and electricity, and the men attending spent time working in Fiberglas and/or electricity.

Before the workshop came to an end an evaluation session was held under the leadership of Robert Worthington, assistant state supervisor, Trade and Industrial Education; and Howard Walton of St. Cloud State Teachers College. — *Charles Cummer, publicity.*

FAIRFIELD COUNTY INDUSTRIAL ARTS ASSOCIATION

Industrial-arts teachers of Fairfield County met on February 13, 1957 at the New Long

(Continued on page 6A)



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EASIER HANDLING! Handle positioned to eliminate nose or tail heaviness. No starting twist.

FASTER! B&D Impact Wrench hits maximum torque in 6 seconds, twice as fast as competitive tools.

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Only Black & Decker Impact Wrench offers proof of POWER-BUILT ruggedness

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ASSOCIATION NEWS

(Continued from page 4A)

Lots Junior High School, Westport, Conn.

The program for the evening included shop visitation from 7 to 8:00, followed by the business meeting, conducted by President Ralph Killelea.

Frank Skinner of Long Lots Junior High School gave a report and submitted recommendations of his committee for the improvement of meeting and conference programs.

Byron Berry, assistant supervisor for industrial arts, Stamford Public Schools, reported for the Connecticut Industrial Arts Association. He is the county representative to the State Association.

Ernest Bono, Central High School, Bridgeport, and membership chairman, reported on County Association Membership to date.

Edward Stack, second vice-president, and state chairman of the New England Industrial Arts Association, reported that the 1957 New England Convention will be held November 1 and 2, at Burlington, Vt.

The principal speaker of the evening was Lt. Wells of the Armed Forces, Westport Nike Site. Lt. Wells's illustrated talk on Nike, our offensive weapon for defensive use, was followed by a question and answer period.

The evening was concluded with refreshments and door prizes. — *John J. Burkhardt, secretary.*

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ACCURACY, CAPACITY AND POWER

This 12" swing lathe typifies Logan advanced design and rugged construction. Gears are extra wide and strong. Shafts are extra heavy. The lead screw has a full ⅞" diameter. The precision carriage rides on a two-V-way, two-flat-way bed that is rugged, precision ground and warp-free. The heavy spindle turns on oversize ball bearings, no bearing adjustment needed for any speed between 38 and 1575 rpm. This lathe, and every Logan Lathe from 14" swing down to 9" swing, is dynamically balanced before it is shipped. The result is *sustained accuracy* and smooth, quiet power on every lathe turning operation. See your Logan Lathe dealer for more facts—or mail us the coupon below.

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School.....

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CONVENTION HELD AND NEW OFFICERS ELECTED

The Idaho Industrial Arts Association held their annual convention on February 15, 1957, in Boise, Idaho. The convention consisted of a business meeting devoted to pertinent problems facing the association, and a discussion of bettering the industrial-arts program in Idaho.

The newly elected officers are: president, Thomas Matthews, South Fremont High School, St. Anthony; vice-president, Chester Colwell, industrial-arts supervisor, Boise schools; and secretary-treasurer, Martin Metz, North Junior High School, Boise, Idaho. — *John Findlay.*

WESTERN PENNSYLVANIA INDUSTRIAL ARTS FAIR

In co-operation with Ford Motor Company and Kaufmann's Department Store of Pittsburgh, the Western Pennsylvania Second Annual Industrial Arts Fair will be held in the eleventh floor auditorium of Kaufmann's Department Store, Fifth Ave., Pittsburgh, Pa. The dates are May 6 through May 11, 1957.

Industrial-arts instructors are urged to arrange to have their pupils' projects exhibited in this show.

The judging will be on the same basis as in the International Awards program for selection of winners in groups under each classification. The judging will be done by qualified representatives from industry and schools.

Those projects that are considered outstanding by the judges will have the transportation paid to the International Show in Dearborn, Mich., by the Ford Motor Company; also a Certificate of Merit will be given the pupils for their outstanding projects.

For additional information write to: *George L. Gieske, Thomas Jefferson Jr. High School, Box 36 R.D. No. 1, Clairton, Pa.;* or *Olan T. Mahaney, Connelly Vocational High School, Pittsburgh 19, Pa.*

ANNUAL SUMMER CONFERENCE AND WORKSHOP

The annual summer conference and workshop for Pelican State Vocational Association will be held at Southern University, Baton Rouge, La., during the period July 9 to 13, 1957.

Eugene Harris, P.O. Box 2012, Baton Rouge, La., is president.

NEW OFFICERS ELECTED

The Machine Shop Teachers Association of New York City have elected the following new officers at their recent meeting:

President, Charles Martinetz, teacher of machine shop, Samuel Gompers Vocational & Technical High School, Bronx, New York City; Vice-president, Morris Shapiro, teacher of machine shop, Williamsburgh Vocational High School, Brooklyn, N. Y.; Treasurer, Ray Greenberg, teacher of machine shop, Brooklyn High School of Automotive Trades, Brooklyn, N. Y.; Secretary, James Anderson, teacher of machine shop, Queens Vocational High School, Long Island City, N. Y. — *Earl E. Tatro, Executive Committee.*

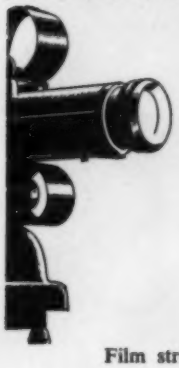
SPRING CONVENTION OF M.I.E.S.

The eleventh annual spring convention and Industrial Arts Fair of the Massachusetts Industrial Education Society will be held on May 18, 1957, at Meadowbrook Junior High School in Newton Centre, Mass.

Projects made in schools throughout the state will be displayed in the gymnasium. Parents, pupils, and the general public will be

(Continued on page 20A)

STANLEY SHOP TALK



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Nine strips of 35 mm safety film in individual cans with a manual of suggested questions for testing.

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$5.00 per set, packed in a handy box, postpaid, with a booklet of suggested test questions. Use the coupon.

Film strips on: (1) Planes (2) Measuring, Testing, and Marking Tools also available at $5.00 per set

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WOOD CHISEL

with 4½" Blade

STANLEY No. 40 — Sturdy "Boy-Proof" for trouble-free performance in school shops. One-piece alloy steel blade and shank extend almost through the handle. Tough plastic handle assembled to blade — will not come loose. Steel cap on handle transmits hammer blow directly to cutting edge of blade. Blade has excellent and uniform cutting qualities. Made in complete range of sizes. Longer blade provides extra grinding life.

No. 40

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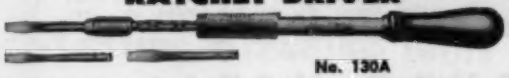

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1100 rpm full load	225 rpm full load	1100 rpm full load	1150 rpm full load	330 rpm full load

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Subject you teach .....

School .....

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Oliver Band Saws are also made in 30", 36", 38" sizes.

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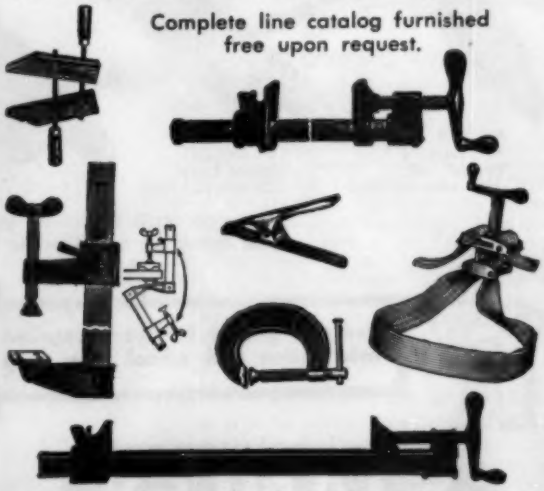

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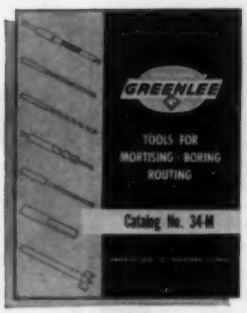

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Fast, smooth cutting with minimum break out. Designed for boring plywood, portions of holes, and holes close together. Will not choke with chips.

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Easily adjusted for depth by socket set-screw. Types for drilling beveled countersinks for flat-head wood screws and flat-bottom countersinks.

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For smooth, rapid boring in hard and soft wood. Double-Spur, Extension Lip, Solid-Center and Ship-Auger types. Screw or brad points.

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Division of Greenlee Bros. & Co.
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It's 82 to 1... and going up!

How teachers of auto mechanics can help solve a national problem

A recent report given at the American Vocational Association convention revealed there is at present only one mechanic for every 82 cars in use in the United States. And the outlook for the future is even worse.

For a nation that depends on wheels, this shortage of trained mechanics presents a serious threat to our economy and could be disastrous in case of a national emergency.

Every year the raw material to solve this critical shortage passes through your classrooms. These are the eager boys who ask: "What shall I do after my training's finished . . . what field will pay enough . . . where do I start . . . how do I go about it?" You have a gratifying opportunity to guide those asking these career questions, especially the young men who can't go on to college.

Your help is needed

Point out in your classes that unparalleled advantages exist in the automotive field. Tell your students that, as future mechanics, they will be entering a business where a critical shortage exists, and where pay and security is higher than for many other skilled trades.

Make it clear, too, that after a few years of on-the-job training, they will be ready to move ahead to supervisory positions, as service managers for auto dealers — even to ownership of their own garages.

The best of America is yet to come — an even better economy with hundreds of industries benefiting from millions more cars operating on thousands more miles of new and improved roads. Your classroom is a reservoir of man power. You are the key man in the problem of supply.

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*Snap-on is the trademark of Snap-on Tools Corporation.

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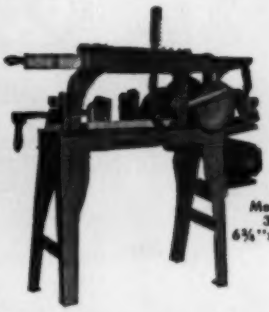

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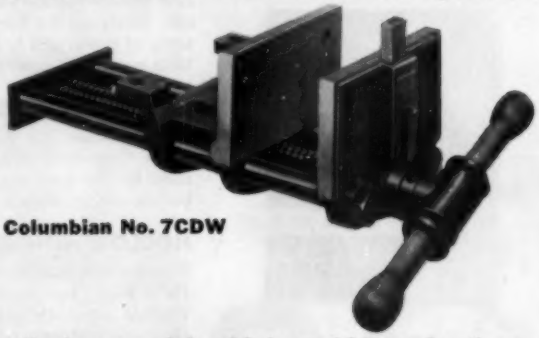

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You may select Plain or Dog Type front jaws. You may specify Hardwood, Tubular Steel or Adjustable Steel Handles. Write for Bulletin LL-3184.

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Here is an entirely new concept in band saw design and development. It's the most flexible saw for every type of work . . . rugged enough for continued high-production service in industrial wood-working . . . priced reasonably enough for the limited budgets of school, vocational and smaller cabinet shops.

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Write for Bulletin LF-108 and for Special Literature on Marking — for use in Industrial Arts Instruction.

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Your local Armstrong Distributor carries ARMSTRONG Set-up and Hold-down tools in stock in sizes for every operation. Stop haphazard setting-up methods. Provide each of your machines with a full complement of ARMSTRONG Set-up and Hold-down Tools.

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4-STUDENT BENCHES. Model 1048 has 72 x 48 x 1½ in. top and 72 x 22 x 6 in. testing panel. Model 1049, illustrated above, has 72 x 48 x 1½ in. top and 72 x 7¾ x 6 in. electrical panel with cutouts for 8 standard boxes and receptacles. Both have sixteen 14 x 20 x 5 in. drawers.

Select your electrical benches from the complete HALLOWELL line

Standard HALLOWELL benches for electrical projects range from 4-student models with drawer pedestal units to 1 and 2-student models with open bases. Any one of these sturdy, functional benches can be supplied with an electrical panel, testing panel or both, depending on individual requirements. Bases are of prime steel, phosphate coated, then finished in SPS green baked-on enamel. Working surface is famous HALLOWELL ShopTop—tough, warpfree, splinterproof laminated wood core faced with sheets of kiln-dried wood particles bonded with resins under heat and pressure.

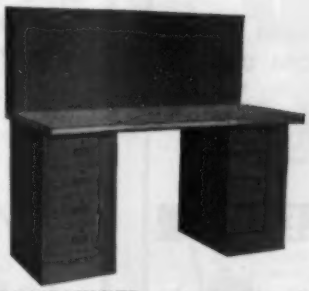
These benches are just one group of units in the complete HALLOWELL School Shop Furniture line. See our Bulletin 2246 for all units. Write for your copy today. Hallowell Shop Equipment Division, STANDARD PRESSED STEEL CO., Jenkintown 74, Pa.

STANDARD PRESSED STEEL CO.

HALLOWELL SHOP EQUIPMENT DIVISION SPS

JENKINTOWN PENNSYLVANIA

CABINET BASE BENCHES are available in a number of top sizes. The cabinets have sliding doors which operate smoothly on nylon rollers, are equipped with two adjustable shelves. Electrical test panel shown.



UNIT BASE BENCHES are regularly supplied with 2-drawer pedestal base units. Each drawer is 14 x 20 x 5 in., has flush pulls, and operates smoothly on nylon rollers. Electrical test panel shown.

OPEN BASE BENCHES have all-steel base consisting of two industry-proved bench leg assemblies with two integrally welded cross braces. These are joined by a ribbed stringer. Electrical panel shown.

PARKS PLANERS Give Your Students Practical Experience on Popular Industrial Machines

Students learning on Parks Planers benefit not only from the safe, easy, and accurate operation of these planers, but also from the practical experience of working on the same type of high-speed, precision built planers they will eventually use in their trade. The Parks No. 20, 20" Planer (at right) has a 4-knife cutter-head with a speed of 3600 R. P. M. and offers two feed speeds—20 and 40 F. P. M. or 40 and 80 F. P. M. Available with knife-grinding attachment at additional cost.

THE **PARKS** No. 20
20" Thickness PLANER
WITH KNIFE-GRINDING ATTACHMENT

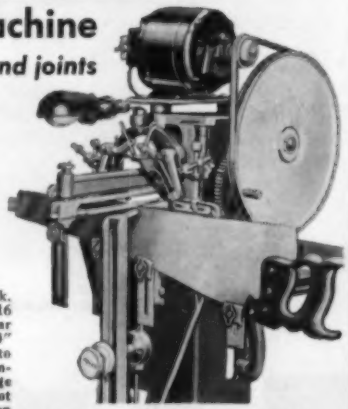
THE **PARKS** HEAVY-DUTY
12" Thickness PLANER

At left is the Parks Heavy-Duty 12" x 4" Planer—a compact, sturdy thickness planer with feed speed of 16 F. P. M. at 4000 R. P. M. Will handle material as short as 6" and as thin as 1/16". Both planers are priced low enough for even the most modest shop budget. WRITE FOR COMPLETE DESCRIPTIVE LITERATURE.

THE **PARKS** WOODWORKING MACHINE CO., Dept. 22 1546 Knowlton St., Cincinnati, Ohio

SAW FILING

This ONE Machine
automatically files and joints
HAND, BAND, CIRCULAR SAWS



The Foley Saw Filer is ideal for sharpening saws used by students in school shops. It keeps them in tip-top shape, faster and better than by hand filing. Used by Army, Navy, hundreds of manual training departments and industrial plants. The Foley is the only machine that files and joints all hand, back, and mitre box saws from 3 to 16 points per inch, crosscut circular saws up to 16" diameter (24" optional), and band saws up to 24' long. Patented jointing principle automatically evens up large and small teeth, so saws cut faster, truer, cleaner — stay sharp longer. Foley filed saws have less breakage and last longer.

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You may have the privilege of using the Foley Saw Filer in your own shop for 30 days. Write or send coupon for details and list of school users.

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NO. 132 BENCH LEVEL

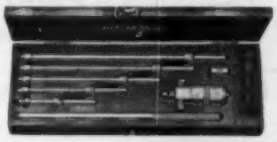
A moderately priced precision level with main vial and double plumbs. 4", 6", 9", 12" and larger sizes. Black wrinkle finish with machined bearing surfaces. Base grooved for use on cylindrical work.

NO. 902 SERIES SET OF TOOLS

No. 902A has 9" combination square; No. 902B a 12" square. Both have 1" micrometer, center gage, center punch, 6" rule, 4" inside and outside calipers, dividers and hermaphrodite calipers. Other sets available.

NO. 124A INSIDE MICROMETER

Capacity 2–8 inches. Set includes Satin Chrome micrometer head with ½ inch movement, measuring rods, spacing gage and spanner wrench. Auxiliary handle also available. Larger ranges available.



NO. 596 PENCIL DIVIDER

Bow-type side adjusting divider with twin chucks that hold steel points or pencil leads. Excellent for drawing or layout work. Capacity, fully open, approx. 3¼ inches.

"SATIN CHROME" STEEL RULES

Flexible and spring tempered types, 6, 12, 18 and 24-inch lengths, fractional or decimal graduations. Easy to read with long wearing, no-glare Satin Chrome Finish (pioneered by Starrett).

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Reversible point telescopes into knurled stock. Hex head prevents rolling. Chuck holds tempered steel point securely. Handle diameter ¼", point length 2⅜".

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Describes the complete line including many tools priced to fit school shop budgets. Write for your free copies. Address Dept. CE, The L. S. Starrett Company, Athol, Massachusetts, U. S. A.

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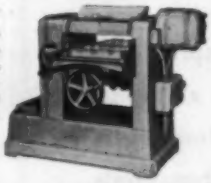

HAND JOINTER—compact and accessible. Built in 8" and 12" width. Table 6'2" long, maximum rabbet depth 9/16". Round, 3 knife safety type cylinder head, 3 HP 3600 RPM motor.

SHAPER—1" diameter spindle, with 4½" vertical adjustment, 36" x 26" table, spindle speed—8,500 RPM, floor space—34" x 37". →

BAND SAWS—machine 20" diameter wheel illustrated. Floor space 24" x 36", horizontal capacity 20", vertical capacity under guide 11". Also 27", 32", and 36" machines available.

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Catalog

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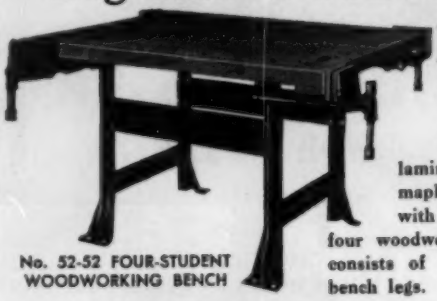

No. 52-52 FOUR-STUDENT WOODWORKING BENCH

No. 52-52 is 52" long, 52" deep and 31¼" high. The laminated edge grain maple top is 2¼" thick, with end bolsters and four woodworkers' vises. Base consists of two pressed steel bench legs.

• STURDY CONSTRUCTION • MODERN • ECONOMICAL • PRACTICAL

No. 52-36 is 52" long, 36" deep and 31¼" high. The laminated edge grain maple top is 2¼" thick, with end bolsters and two woodworkers' vises. Base consists of two pressed steel bench legs. Other sizes also available.

No. 52-36 TWO-STUDENT WOODWORKING BENCH

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Locust at Fourth St. Dept. V-16 Philadelphia 6, Pa.

School Shop Hints

Teaching and Shop Operating Unit

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AN INSTRUCTION-TEACHING AID

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MANY EDUCATORS in industrial and vocational schools now include Pittsburgh COLOR DYNAMICS in their training of tomorrow's shopmen. They recognize that knowledge of this system of painting will be of great help to students in their future tasks.

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• **Morale-building colors** on walls and ceiling promote cheerfulness and enhance morale of employees. Safety colors on mobile equipment and traffic lanes reduce danger of time-loss accidents.

• **If you want** your students to be well-equipped for tomorrow's responsibilities, begin now to teach COLOR DYNAMICS in your classes. In addition, demonstrate its principles in a practical manner by using them in the decoration of classrooms and equipment.

It's FREE—A Modern Color Plan for Your Classrooms

• Write today for a free booklet explaining how Pittsburgh's principles of COLOR DYNAMICS can be applied in industry. Better still, we'll be glad to demonstrate the benefits of this modern painting system in your classrooms. We'll provide a detailed color plan of the entire area, or part of it, without cost or obligation. Call your nearest Pittsburgh Plate Glass Company branch and arrange to have a representative see you at your convenience. Or mail coupon at right.

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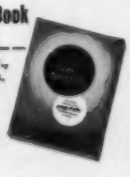

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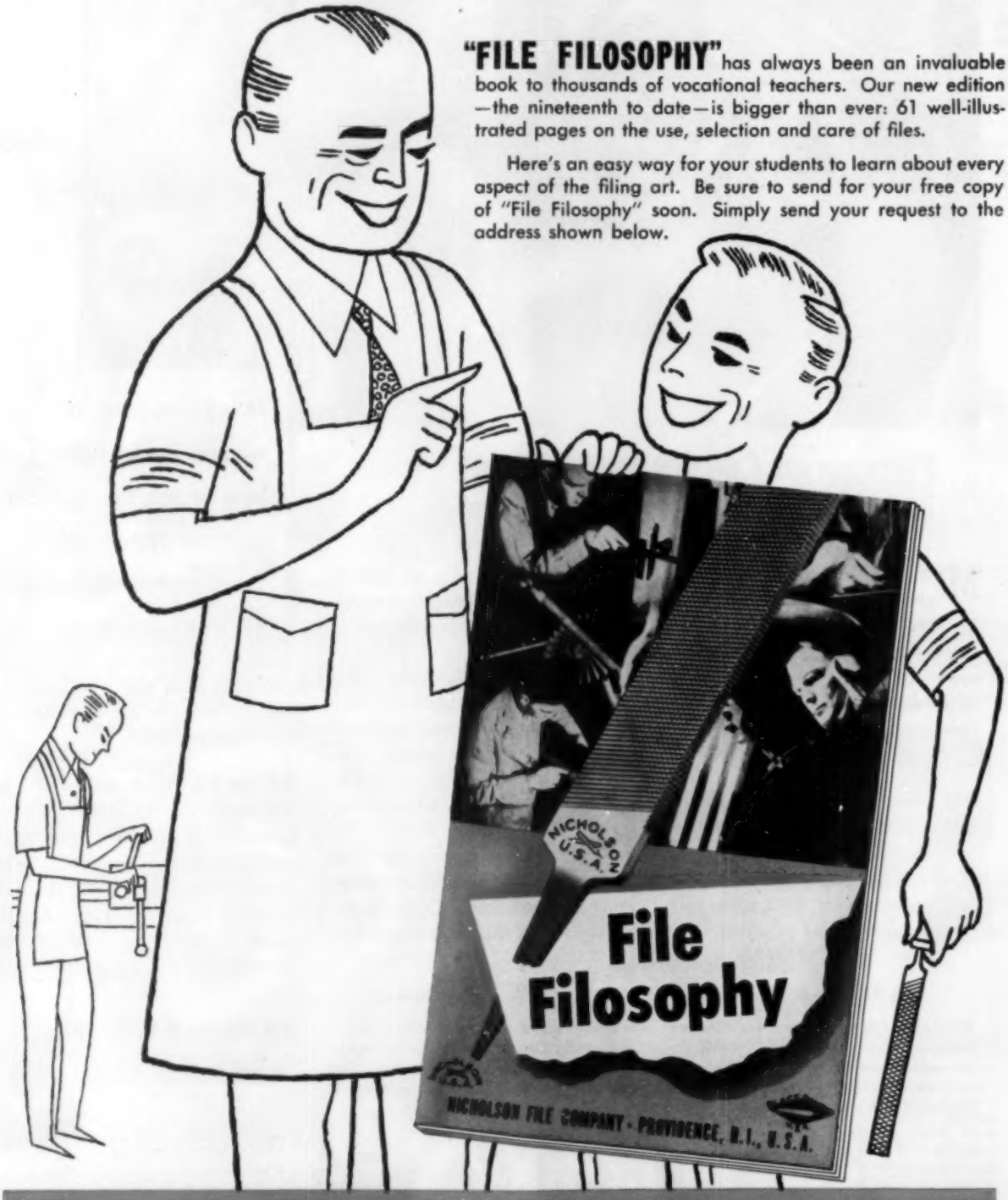

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Industrial Arts and Vocational Education
The Shop Teachers' Professional Magazine
MAY 1957

Preliminary Work That Makes Requisitioning Easy —

Industrial Arts Inventory and Purchasing

JULES BERTIN
General Metals Shop Teacher
North Allegheny Joint High School
Pittsburgh, Pa.

Industrial-arts equipment, materials, and supplies inventory systems are commonly cumbersome or inadequate and, all too frequently, nonexistent. In order that matters of inventory and procurement may be handled in an efficient manner and in order that teachers may have information regarding their inventory readily accessible, an easily administered system should be in operation in every industrial-arts department.

Running inventories are probably the most desirable. However, these are generally deemed impractical inasmuch as teachers do not have the time to devote to their proper administration. The teacher's prime responsibility is teaching and looking after the welfare of his pupils rather than devoting hours to the minute details of a running inventory. After exploring several possibilities, the annual inventory system herein described was developed for our school. It fills requirements of the board of education policy adequately and provides a complete inventory of every item used in the department with the exception of capital outlay which is on a separate inventory. Our annual departmental budget is planned to cover complete operation of the department except for purchase of additional equipment or the replacement of old equipment. This system has been proved quite adequate for our needs and the simplicity of its operation has impressed many teachers. As it is working out so well in our school shops, the system is being presented for examination and consideration by teachers who are seeking a simple, workable, and adequate inventory system.

In our inventory system, each area of activity is identified by a letter signifying a categorical grouping. The categorical grouping is as follows:

Industrial Arts Department
Inventory — Categorical Grouping

A — *Wood Shop*
- A-1 Woodwork power tools, parts, accessories
- A-2 Wood and wood products
- A-3 Woodwork hand tools, parts, accessories
- A-4 Wood abrasives
- A-5 Wood finishing materials
- A-6 Wood fasteners
- A-7 Woodwork supplies, unclassified
- A-8 Upholstering tools and supplies

B — *Machine Shop*
- B-1 Machine shop power tools, parts, accessories
- B-2 Ferrous metals
- B-3 Nonferrous metals
- B-4 Machine shop hand tools, parts, accessories
- B-5 Metals abrasives
- B-6 Metals finishing materials
- B-7 Metals fasteners
- B-8 Machine shop supplies, unclassified

C — *Plastics Shop*
- C-1 Plastics power tools, parts, accessories
- C-2 Plastics stock
- C-3 Plastics hand tools, parts, accessories
- C-4 Plastics abrasives
- C-5 Plastics finishing materials
- C-6 Plastics fasteners and findings

D — *Electric Shop*
- D-1 Electric shop power tools, parts, accessories
- D-2 Electric shop testing equipment, parts, accessories
- D-3 Electric shop general supplies
- D-4 Electric shop hand tools, parts, accessories
- D-5 Electric shop supplies, unclassified

E — *Drawing Room*
- E-1 Drawing room equipment
- E-2 Drawing supplies

F — *Sheet Metal Shop*
- F-1 Sheet metal power tools, parts, accessories
- F-2 Ferrous sheet metals
- F-3 Nonferrous sheet metals
- F-4 Ferrous metals bar stock
- F-5 Nonferrous metals bar stock
- F-6 Sheet metal hand tools, parts, accessories
- F-7 Sheet metal abrasives
- F-8 Sheet metal finishing materials
- F-9 Sheet metal fasteners
- F-10 Sheet metal shop materials, unclassified

G — *General Supplies*

There is an inventory card for each item. Each card carries the complete specification of each item.

"Ordering Unit" describes quantity in which item is to be ordered, i.e., quart, gross, board foot, linear foot, etc. At time of taking inventory, the quantity on hand is recorded in the "Inventory" column. The quantity needed for the ensuing year is indicated in the column headed, "Order for." Following the tabulation of bids and the placement of the orders, the unit cost of the item is recorded in the "Unit Cost" column. During the school year, as items not on inventory list are wanted for the next year, the teacher prepares cards with specifications for the inventory file.

Following spring inventory, needs for the next year are recorded on the inventory cards. At this time, the cards for the items to be ordered are pulled from the file to be turned over to the purchasing department for the preparation of bid sheets. Our format for bid sheets is as follows:

Each group of each category is started on a new page and the bid sheets of each group are stapled together. Thus, the suppliers of power tools, parts, and accessories will be sent only bid sheets of groups A-1 and B-1; suppliers of ferrous metals will be sent only the bid sheets of group B-2; and general hardware dealers will be sent the bid sheets of several groups of several categories.

Two sets of bid sheets are sent to each prospective bidder in order that he will have an exact duplicate of his bid for his files. Thus, if it is necessary to communicate with a successful bidder regarding individual items, the items can be pin-pointed by referring to the group and item numbers, i.e., Group B-6, item 16. This method of identifying items in question makes the matter of inquiries exceedingly simple.

Because the bidder has duplicate copies of bid sheets, the purchasing department need not include specifications on the purchase orders. This simplifies the matter of preparing purchase orders because it eliminates the need for copying specifications as well as eliminating possibility of stenographic error. Bidders are informed that purchase orders will identify items to be shipped by group and item numbers only. A typical purchase order is illustrated here.

With bid sheets sent to prospective bidders, the purchasing department includes instructions setting forth board of education policy regarding acceptance of bids and terms of payment. In addition to these instructions, the bidders are furnished instructions that are of concern to the industrial-arts department.

Bid on *No substitutes* where manufacturers' numbers are specified except where equals are indicated as acceptable.

Deliveries, except back-ordered items, are to be made in bulk prior to August 30, 1957.

Do not make partial shipment of an item.

Packages are to be identified by categorical letter in order that they may be routed to proper shop areas.

Deliveries are to be made to the industrial-arts department receiving room at the north end of the high school building.

This system of inventory and procurement has been presented not as an infallible plan that will fit, per se, the needs of every industrial-arts department but rather as one that can be adapted to individual shop needs. The

A-1 Woodwork Power Tools, Parts, Accessories

Item	*Quantity*	*Description*	*Unit Cost*	*Total Cost*
1	1 only	Disston #3200 (or equal) H. G. Combination Circular Saw Blade 10" — 5/8" arbor hole	_____	_____
2	2 only	Delta #937 Face Plates	_____	_____
3				
4				

B-2 Ferrous Metals

Item	*Quantity*	*Description*	*Unit Cost*	*Total Cost*
1	300 lin. ft.	Hot Rolled Steel, 3/8" diam.	_____	_____
2	200 lin. ft.	Hot Rolled Steel, 1/2" diam.	_____	_____
3				
4				

PURCHASE ORDER

North Allegheny Joint Schools

BRADFORD WOODS BOROUGH
FRANKLIN TOWNSHIP ... MARSHALL TOWNSHIP
McCANDLESS TOWNSHIP

Deliver to *North Allegheny Jr.-Sr. High School*
Industrial Arts Dept.
350 Cumberland Rd., Pittsburgh 37, Pa.

Jones Hardware Company
444 Main Street
Anytown, U. S. A.

Mail Bills and Invoices to Supervising Principal
North Allegheny Joint Schools
350 Cumberland Road, Pittsburgh 37, Pa.

Date_____
Dept._____

Quantity	Item	Unit Price	Total
	In accordance with your bid of March 18, 1957 please furnish the following:		
	Group A-3 items 4, 5, 7, 8, 10		
	Group A-7 items 1, 2, 3, 4, 5, 6, 8		
	Group B-7 items 4, 7, 8, 9, 15, 16		

Send to Above Address Via *Your delivery, Local Express, Motor Freight*
Make no shipments by R.R. Express or R.R. Freight

Ordered by *Jules Bertin* Date_____
Materials Received by_____ Date_____
Payment Approved_____ Date_____
Posted_____

INVENTORY Category A-5

Industrial Arts Department

North Allegheny Jr.-Sr. High School

Description *Floor and Trim Varnish*

Pittsburgh Plate Glass Waterspar #82–100 (or equal)

Ordering Unit *Quart*

Inventory:		Order for:		Unit Cost:
3–1–57	1	'57–'58	4 quarts	
3–1–58		'58–'59		
3–1–59		'59–'60		
3–1–60		'60–'61		
3–1–61		'61–'62		
3–1–62		'62–'63		
3–1–63		'63–'64		
3–1–64		'64–'65		
3–1–65		'65–'66		
3–1–66		'66–'67		

Inventory Card

major purpose prompting the presentation of this plan is to make industrial-arts teachers aware of the fact that the problems of inventory and procurement can be reduced from a burdensome chore to a rather simple task.

Industrial Arts Teachers Aim at Industrial Efficiency —

Industrial Education in Harford County, Md.

JOHN R. WALKER
Supervisor of Industrial Education
Bel Air, Md.

Harford County, Md., is located in the northeastern part of Maryland within easy driving distance to Baltimore and Washington to the south, and to Philadelphia and New York to the north. The county is a prosperous, forward-looking community and its citizens are especially proud of their school system. Through the efforts of Charles W. Willis, superintendent of schools, and a progressive board of education each of the 23 schools of the county is either new or completely modernized. Within recent years smaller high schools have been consolidated into seven large schools, each centrally located in the area in which it serves. This consolidation has made available to students a larger selection of courses and the introduction of services and programs that would not have been possible in the smaller schools. The industrial-education program is one of these services.

Since the consolidation of the high schools in the county, industrial education has progressed to an enviable position in the total education program. To maintain this position industrial-arts teachers work in their schools to improve their own shops and at a county level to increase the effectiveness of the areas presented. Each summer many of the shop instructors get valuable training which helps to keep them up-to-date on modern industrial practices by working at the Aberdeen Proving Grounds, the Army Chemical Center at Edgewood, Martin Aircraft, or at one of the many industries in the area.

Each school has an individual industrial-arts program planned to serve the local community. The industrial-arts areas in some schools, however, are not functioning at full strength because of the difficulty of securing qualified personnel. From past experience the county has found that it is better to close a shop than to take the risk of placing a person of questionable capability in the vacancy.

The following are the general objectives of each school's individual program:

1. To encourage the student to develop originality and creative thinking and to provide him with information and manipulative experiences which will assist him in the development of skills useful in later life.

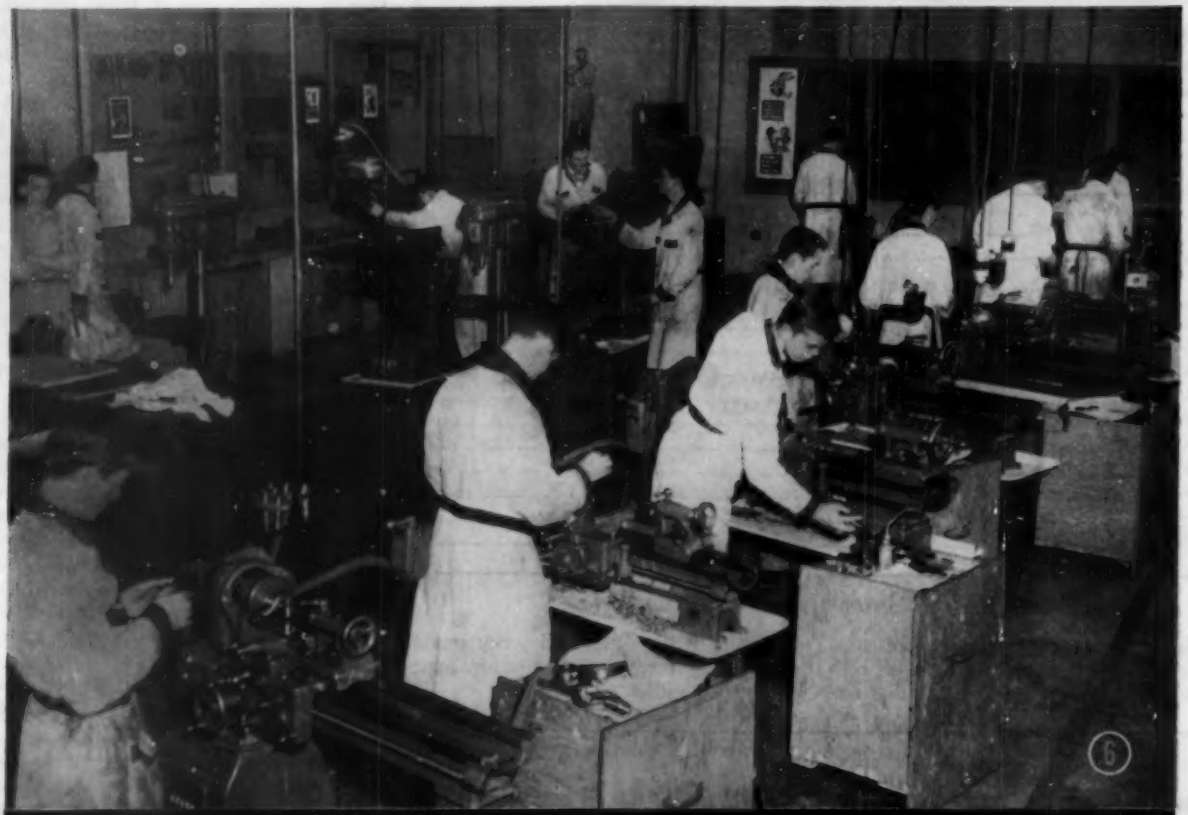
2. To develop latent qualities of leadership and/or ability to follow that is based upon a sound sense of values.

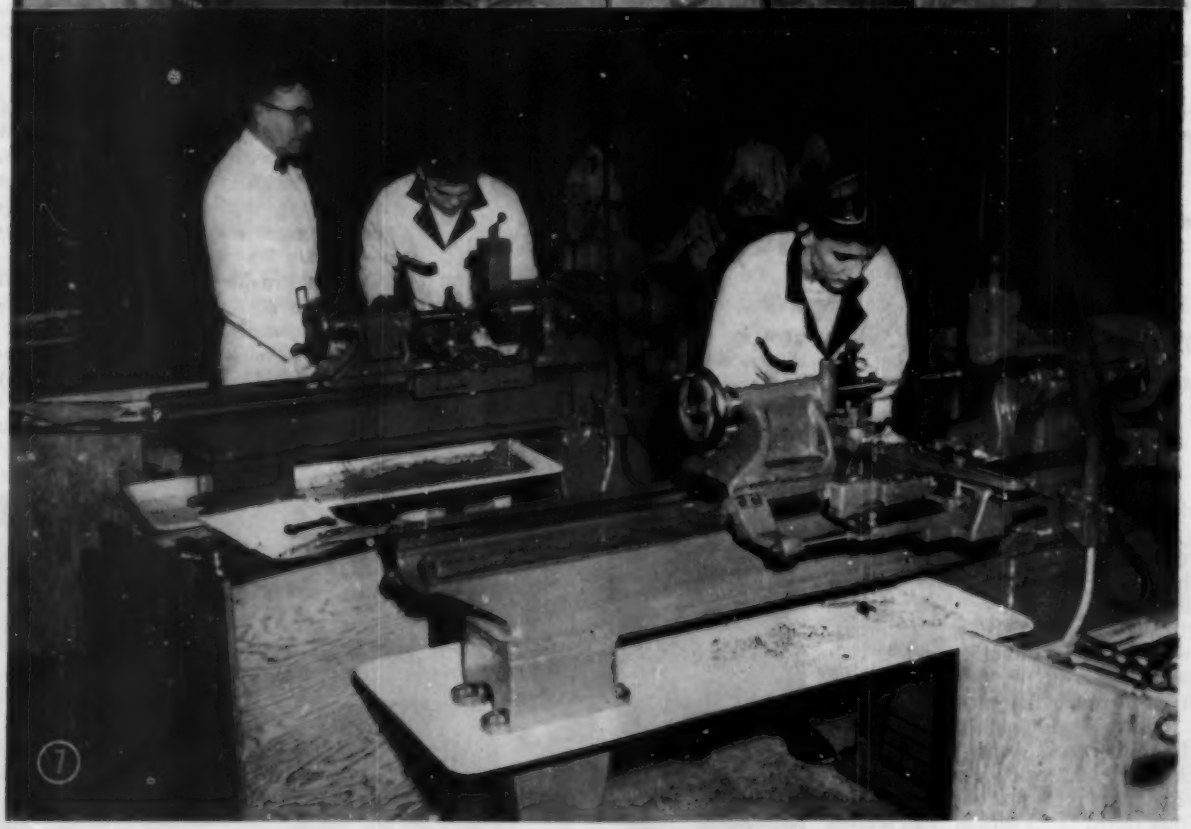
3. To insure to all students a type of training that will enable them to assume responsibility as citizens of communities.

4. To provide experiences that will develop a sense of initiative and personal responsibility.

5. To develop attitudes of: (*a*) consideration for workers in all fields; (*b*) regard for co-operation among members of a group; (*c*) concern for safe work practices; (*d*) respect for property.

Fig. 1. Second-year drafting students





Figs. 6 and 7. Machine shop classes at the Havre de Grace High School, Havre de Grace, Md. Marshall Tarbert, instructor

6. To develop an interest in industry and in methods and problems of production and exchange.

7. To develop in each student the habit of an orderly, complete, and efficient performance of any task.

8. To develop in each student a feeling of pride in his ability to do useful things.

9. To develop in each student the appreciation of good design and workmanship and the ability to select, care for, and use industrial products wisely.

During the 1956–57 school year approximately 70 per cent of the boys in the county received training in this shop program. The boys in eighth and ninth grade must take shop as part of their general education. Students in the tenth, eleventh, and twelfth grades may elect to work in individual shops or to take a comprehensive industrial-arts program.

Fig. 2. Leathercraft in the general shop

— Photographs, Mr. Donald Nicholas, Audio-Visual Co-ordinator, Bel Air High School, Bel Air, Md.

A Brief Outline of Offerings at Different Levels

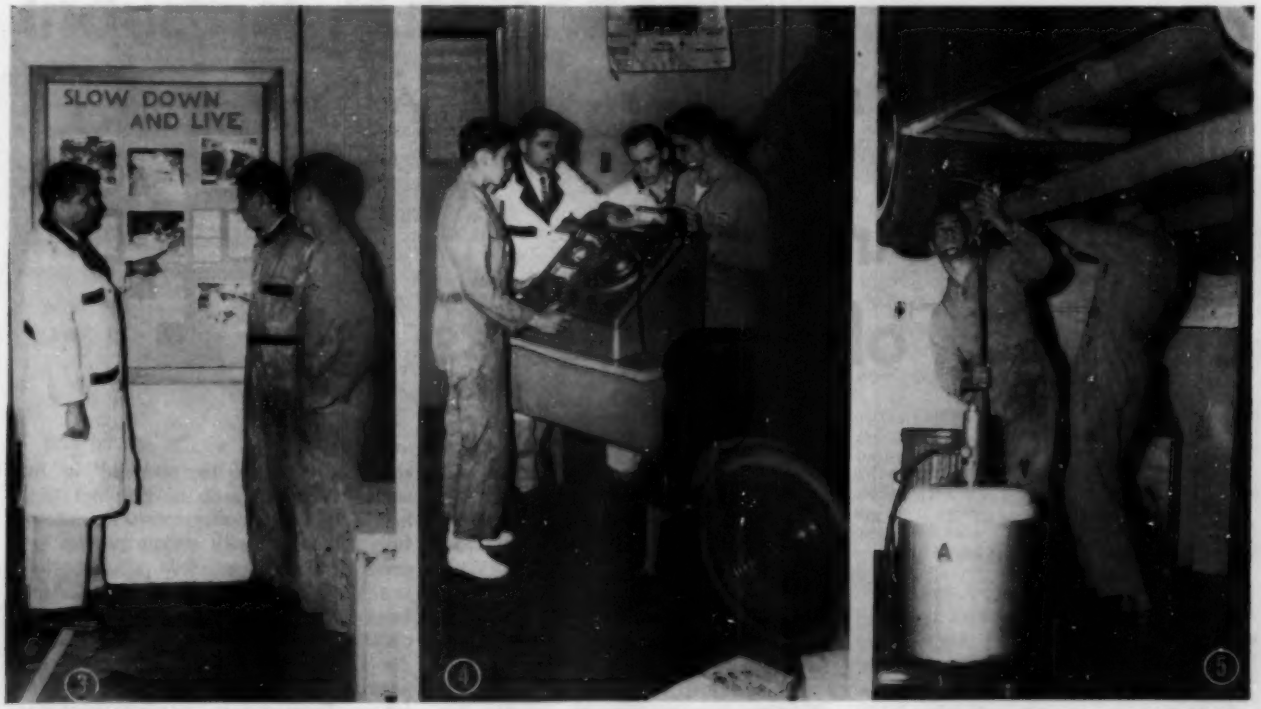
The Junior High School: The junior high school program of industrial-arts in the Harford County Schools is an exploratory course of instruction. As the main purpose is to acquaint the students with materials used in everyday living, they work with such things as wood, leather, plastic, and metal.

Before a student begins his project, he must outline his work on a shop developed planning sheet. Following this, he proceeds to make the project according to his specifications.

During the planning and the execution of the project, the pupil learns not only to draw and to interpret a working drawing, but also to use the tools and machines necessary in each area. In addition, he acquires knowledge of the characteristics and the cost of materials and of the importance of shop safety and co-operative work habits.

The program is arranged in such a manner that the student has many opportunities to realize the mechanical interests he may have. He is also encouraged to develop satisfaction and pride in producing things of superior workmanship.

The Senior High School: One of the great needs of industry today is well-trained workmen who are skillful with their hands and trained to think about



Figs. 3, 4, and 5. Eleventh grade automotive class. Mr. George J. Makin, instructor

their work, diagnose troubles, and suggest improvement. No man can hope to succeed in his work unless he is willing to study and increase his ability.

The day of the mechanic who could succeed on the job by being able to use only his hands has passed. The good mechanic is in reality a nondegree-holding engineer. He has to be this in order to work to the one ten thousandths part of an inch in the machine shop, to repair and service electronic equipment, or to tear down and repair the automatic transmissions of the new automobiles. The mechanic of today uses his mind just as much as his hands.

Auto Mechanics: Through the automechanic program the school tries to give the students skills and knowledge that will apply to a great number of related occupations; aircraft mechanic, diesel mechanic, auto mechanic, etc. The student has the opportunity to learn the proper use of several hundred different tools. The shops are equipped with many of the latest tools and equipment of industry.

The student should, after training, be skilled in the repair of automobiles. He should have a knowledge of the mass-production methods learned through field trips, films, books, and lectures.

The organization of the shops is such that the student may practice leadership. Shopwork consists of both theory and practical work experience. Students perform major overhauls, generator and starter repair, brake work, tune-ups, and other similar jobs. A successful on-the-job training program is functioning as a part of the automechanics instruction.

The Machine Shop: We are living in a highly mechanical age. Practically everything is done with the push of a button or the flick of a lever. All these ingenious mechanical and electronic devices are built of accurately and carefully made parts. The machinist plays a very important part in their manufacture because it is he who translates the ideas of the designer and inventor into practical and efficient machines.

Obviously, the machinists' trade takes on added importance and prestige in this world of science and invention, and will continue to do so just as long as science and industry continue to grow.

At the high school level the student is offered a machine-shop program which, in our thinking, is highly practical. The school does not attempt to teach a trade in as much as the high specialization demanded by industry today cannot be taught in the time the student is in machine shop class. The student is taught to operate and safely use the basic tools: the lathe, grinder, shaper, drill press, milling machine, etc. With this basic training and a comprehensive related program he can, with a minimum of studying and experience, understand and operate the special-purpose machines that prevail in industry today.

Technical Drawing: Facility in reading and understanding working drawings and blueprints is one of the basic skills required of anyone who plans to enter a technical or mechanical occupation.

Courses in the fundamentals of mechanical drawing are planned for the student who enrolls in the industrial-vocational program. The skills and understandings achieved will have a direct relationship to his success in any of the technical programs he chooses to follow.

Drafting can be divided into many specialized fields. Some of these are: mechanical drawing, machine drawing, electrical drawing, and architectural drawing. It is possible for a student to specialize in any one of these fields if he has completed the prerequisite course in fundamentals.

The fundamental course is offered to the first year student and includes an introduction to certain aspects of the subject including: (1) mechanical drawing; (2) pictorial representation; (3) shop sketching; (4) pattern development; (5) geometric construction;

Drafting is available as an elective to junior and senior pre-engineering students as well as to industrial-vocational students.

Industrial Arts Offers Delinquents Worthwhile Activity —

Industrial Arts in the Education of Delinquents

NORMAN W. BEDWELL
Industrial Arts Department
Mississippi Southern College
Hattiesburg, Miss.

The boy who has been classified by law as a delinquent and has been committed to the custody of a training school has most likely lost interest in schoolwork. Therefore, the job of the training school is more difficult than that of the public school. As a matter of fact, some of the boys have an indignant attitude toward all schoolwork which must be eradicated before any adjustment can take place and the student returned to the public school to complete his training.

Industrial arts is one of the strongest elements in correcting the dislike for schoolwork because of the freedom and ease with which the student is instructed and because of the fact that he has an opportunity to work successfully in media with which he can express his own ideas. Any program that is efficient in the training of maladjusted boys must take into consideration the opportunities offered in industrial arts. Its very nature makes it an effective program; there is no limit to its flexibility. Everyone in an industrial-arts class has an opportunity to work within

the range of his ability. Heretofore most of the boys have been trying to perform in subjects beyond their abilities. This sometimes causes a negative attitude toward everything. One of his first reactions may be a dislike for the course. If this situation continues to exist, the dislike may spread to include the teacher and the other members of the class. It is not uncommon for such a student to assume the role of a tough and unruly boy in order that he may gain some attention from the teacher and his classmates. Truancy is another avenue which may lead the unsuccessful boy into delinquency and ultimately to a school for delinquents.

Industrial arts offers the maladjusted boy an opportunity to succeed in his work. This has a tendency to buoy up that feeling that so often accompanies an unsuccessful individual and helps him to straighten up and contribute something worthwhile to his group. This tends to support a feeling of belonging which psychologically soothes the individual. All of these factors work together to improve and refine undesirable behavior.

The antisocial attitude that often accompanies delinquency is of great concern to school officials. The student personnel organization in industrial arts offers an excellent opportunity for life adjustment training that is instrumental in breaking down this poor attitude. The use of a large assortment of tools is in itself a blessing to the training program. This makes possible a rather extensive personnel organization which gives each boy specific duties to perform regularly. These boys should be elected by the group for their respective tasks, then rotated from one job to another to eliminate any feeling of discrimination. This is functional training in a democratic manner that most students are not too familiar with. The initial reaction to the duties may be one of coolness but familiarity will do much to make the student personnel organization function smoothly. Such duties as are performed regularly in the student personnel organization may seem small but the boys can be taught promptness, courtesy, and acceptance of responsibility. The regularity of the duties increases the boys' dependability. Co-operation is easily taught because the tools are used jointly. Working together on group projects seems to develop friendliness and a respect for others.

The fact that industrial arts is broad affords many opportunities at varying levels of abilities. This makes it a popular phase of training for boys, especially those who have enjoyed little success previously. This makes it among the top choices of activities in the readjusting of delinquent behavior. A boy who has had little success in life finds comfort in being able to snap a switch which starts a machine that will cut iron and shape it to his desires. The fact that he has control, no matter how limited, over machines and tools, wood and metal gives him a feeling of power. He is master of something. This may be an outlet for releasing tension stored up in his system that has impaired his progress and caused much unfavorable behavior. It is not unreasonable to believe that the individual may develop interests and aptitudes that will lead him to more specific trade or vocational training and redirect his efforts into profitable and useful service.

An Important Objective in the Industrial-Arts Program —

Industrial Arts and Consumer Education

GARFIELD BURNHAM
Industrial Arts Department
High School
Liberty, N. Y.

The industrial-arts instructor, teaching in the modern industrial-arts shop, is in an excellent position to help his pupils gain an understanding of the nature and quality of the commodities they will purchase as the future home and family providers in our complex society. Our age of advertising surrounds the school child with claims and counterclaims, skillfully portrayed by the commercial artist and the radio and television commercials to appeal to the emotions rather than sound thinking in selecting the necessities of modern life, whether it be a brand of toothpaste or an automobile. In the industrial-arts shop environment, the pupil has the opportunity to examine and work with many of the materials of industry that are used in the manufacture of common products. In his teaching, the industrial-arts instructor should find it a normal function to guide the pupil in choosing, using, and caring for the many items that are directly or indirectly related to the work carried on in the school shop. In a book entitled *Industrial Arts in General Education,* Gordon O. Wilber points out that one of the important objectives of industrial arts, as shown by the analysis of the purposes of general education is "to increase consumer knowledges to a point where students can select, buy, and maintain the products of industry intelligently."[1]

It is generally recognized that more emphasis should be placed on the teaching of our youth to meet the problems of home and family living, and to cope successfully with the demands of modern society. Jessie V. Coles, eminent economist states:

> Training for buyers may be continued through high school and even to college or university levels. There is no lack of material, no limitations in methods of presenting material which would limit such training to any one level of the school system. The important problem rather is the adaptation of the material to the level of the group to whom it is to be presented.[2]

As present and future buyers of products necessary for food, clothing, and shelter, and the many items no

[1]For all footnotes refer to bibliography at the end of this article. Gordon O. Wilber, *Industrial Arts in General Education,* p. 43.

[2]Jessie V. Coles, *The Consumer Buyer and the Market,* p. 578.

longer classed as luxuries, our youth should be given a clearer concept of how to choose and care for these things that are very much a part of their existence. It may be said that with the advent of industrial specialization and the corresponding increase in the dependence of the individual upon commodities made by others it has become more important that the consumer know more about the things he purchases as a part of his daily living in today's world.

With the development of a mass-production economy, many consumer problems have arisen. The multiplicity of consumer goods and services increases the difficulty of making intelligent choices. The matter of becoming informed about what exists and what will best serve one's purposes becomes more difficult.[3]

General Objectives of Industrial Arts

As one of the general objectives of industrial-arts education, consumer education has found ready acceptance by the shop instructor as a means of arousing pupil interest in the many materials and products that form a part of his normal experiences. In 1930, Theodore Struck stated that a boy who has had some experience in hand composition will appreciate good printing; if he has built furniture it will help him to appreciate similar things made by others, and so the boy's appreciations are developed. He chooses more carefully and tastefully and he buys more wisely and economically.[4]

Consumer education may be thought of as an important contributing factor in strengthening the national conservation effort. The increasing population, as well as the rising standard of living makes huge demands upon our natural resources. The recent world war and the Korean conflict have further increased the depletion of our nation's forests, minerals, and soils.

The tide of the earth's population is rising and that of the earth's natural resource base is falling. No one yet knows the ultimate efficiency of man's resource use or, therefore, the eventual population-supporting capacity of the earth or any of its parts. Nevertheless, unless ways can be found to provide subsistence for rapidly increasing populations, we face a dark future.[5]

If we are to conserve our natural resources and use them with maximum effectiveness and minimum waste, then it seems highly important that we educate the oncoming generation of youth to assume the responsibilities of conservation through the proper choice, use, and care of the things they will need as tomorrow's citizens.

[3]Roy G. Price, "Consumer Education," *Encyclopedia of Educational Research*, p. 301.

[4]F. Theodore Struck, *Foundations of Industrial Education*, p. 43.

[5]American Association of School Administrators, *Conservation Education in American Schools*, Twenty-ninth Year Book, p. 73.

From past experience, the writer is aware of no better means of creating pupil interest than to pattern the industrial-arts related lesson in terms of actual articles that the pupil or his family uses. Pupils will enter wholeheartedly into a discussion concerning the merits of one bicycle or automobile when compared with another. It may be said that individuals become acutely aware of the brand name of products they purchase, and are ready and willing to defend their choice regardless of their actual knowledge of the superiority of one brand over another.

Correct knowledge of the qualities of a given brand in terms of comparative prices of other brands should be the basis for proper choosing of purchases. Through consistent advertising methods there has been built up in our manner of thinking the false assumption that "prestige" brands tend to elevate our status and place us on a plane above the common level.

Emulative or imitative consumption thus becomes competitive consumption. Instead of rivalry among buyers to purchase at the lowest price it becomes a rivalry in which buyers compete with one another to prove their financial superiority by the character and volume of their purchases.[6]

On the other hand, proper knowledge of the quality of a certain commodity will prevent the common mistake of buying at a lower price because of false and misleading advertising. It is because of such persistent concepts of a false nature that consumer education has taken its place in industrial-arts education as well as becoming a definite objective of the many subject fields in the modern high school curriculum. Florence B. Stratemeyer and associates, in the book, *A Curriculum for Modern Living*, very aptly state that in the modern curriculum "the learner and the society of which he is a part are brought into relationship and the needed synthesis achieved when the situations of everyday living which children and youth are facing are seen as aspects of persistent life situations with which all members of society must be able to deal."[7]

Consumer Education and the School Shop

Of the many ways in which the instructor may make consumer education a part of industrial arts teaching one of the most effective is a planned program of information sheets relating directly or indirectly to activities carried on in the school shop. Such information sheets may be designed to help the junior and senior high school pupil recognize the differences in various processes and products of industry as they affect him as a consumer, now, and in the future. Common retail products, terms applied to products, and the methods of use and care of products that the pupil becomes familiar with in the industrial-arts shop and in everyday living may be adapted for use as related lesson materials for pupils, both boys and girls. The industrial areas of ceramics, electricity, leather, metalwork, printing, synthetic materials, textiles, transportation, and woodworking offer a wide variety of commodities that are representative of materials used by pupils enrolled in industrial-arts courses and in their growing experiences as young adults. The information sheet may be used as a basis for classroom discussion and pupil assignment at the time when the particular subject matter in a certain area of shopwork can be amplified and made more interesting by such an addition of related information.

Information sheets of this nature may include objectives, introductory statements, references, pupil assignments, and test questions pertaining to the topic involved. Testing procedures for various products may be described wherever applicable. Illustrations may be used in some instances to describe better a particular product or process. Information sheets should be duplicated so that they may be used by the pupil as a part of the related lesson assignment. As time and circumstances permit, the instructor may expand his program of related instruction to include a greater variety of instruction sheets describing further products and processes pertinent to other phases of industrial-arts areas already mentioned. The following information sheet for use as related instruction in the industrial-arts metal area is offered as a typical example:

A TYPICAL INFORMATION SHEET

Metals Used in Jewelry

Objectives

1. To learn about precious metals.
2. To learn the terms associated with precious metals and jewelry.

Introduction

Metals are divided into two groups: precious metals and base metals. Gold, platinum, palladium, rhodium are the precious metals used in fine jewelry. Palladium and rhodium are members of the platinum family. Silver is also classed as a precious metal but it is less expensive.

Base metals are copper, tin, zinc, chromium, nickel, and iron. Base metals are often alloyed to form a different metal. The precious metal, platinum, mixed with its family metal iridium, forms an alloy which is more expensive than either of the metals alone.

Silver, gold, rhodium, and chromium

[6]Leland J. Gordon, *Economics for Consumers*, p. 227.

[7]Florence B. Stratemeyer, *et al.*, *A Curriculum for Modern Living*, p. 72.

plated articles are frequently used for jewelry.

Platinum is considered the most desirable metal for diamond settings. It is much heavier than gold but can easily be shaped into jewelry by hammering or drawing out into wire form. Platinum has a silvery color and does not tarnish. It is combined with iridium, a more costly metal, to make an alloy which is stronger and harder. The proportions are usually 90 per cent platinum and 10 per cent iridium.

Palladium is similar to platinum and is less expensive. It is used as a substitute for platinum.

Rhodium is also a white-colored metal. It is the most expensive of all the platinum family. It has bright luster, durability, and nontarnishing qualities.

Gold has a beautiful, pale, yellow color with a bright luster. It tarnishes very little and maintains its color. Gold is a very malleable metal capable of being hammered into almost microscopically thin sheets called gold leaf.

The quantity of gold present with another metal in an alloy is referred to by the term karat. Twenty-four karat gold would be 100 per cent gold or solid gold, but would be too soft for jewelry use. Twenty-two karat gold is the finest quality gold used in jewelry. This means that 22/24 of the article is gold and 2/24 is composed of some other metal. The usual karat gold qualities are: 22K, 18K, 14K, 12K, and 10K. Any proportion of gold less than 10 karat may not use the term karat.

Base metals are plated with gold by the electroplating process or by covering the base metal with a thin sheet of karat gold. Articles made by the latter process are called gold-filled. Articles covered by a thinner sheet of karat gold are classed as rolled-gold.

When gold is alloyed with copper, iron, and silver it takes on a different color. As an example; white gold is half silver and half gold.

Assignment

Ask the clerk in the principal's office if you may look through the jewelry catalog advertising class rings and pins. Write in your shop notebook the descriptions of various articles, noting the base metal, the karat grade, and the corresponding prices.

Test Questions

1. Name three metals belonging to the platinum family.
2. What is the karat rating of solid gold?
3. How much gold does a 14 karat ring contain in proportion to the metal alloyed with gold?
4. What are the chief properties of platinum?
5. How does supply and demand affect the price of metals?

Field Trips to Industry

The class field trip to industry and to retail and wholesale establishments is recommended for a more complete pupil understanding of quality control of mass-produced articles for common use. Such enterprises have become a vital part of the modern industrial-arts program. Alert instructors in smaller communities where industrial plants are lacking have pioneered in the all-day field trip to the larger cities by bus. Too often, the small-town pupil lacks the opportunity to gain firsthand information offered by the co-operating industries of the metropolitan areas.

The use of sound motion picture films is an excellent method of presenting facts about the manufacture and use of common industrial products. In place of the more desirable field trip, the many free films available today can help enrich the industrial-arts program from the standpoint of consumer knowledge as well as presenting industrial processes and basic tool and machine operations.

Pupils may be urged to become more familiar with sound buying practices through reading books and magazines concerning consumer values. Literature of this type is usually found in the school library and may be made available also in the shop library. Since many families do considerable mail-order buying, the familiar mail-order catalog finds a logical place on the shop library shelf. The leading mail-order houses have long practiced intelligent advertising in an effort to describe comparative product qualities and prices.

Models, mock-ups, and other samples of modern industrial products may be used wherever space is available and the situation permits. As technological advances are made, the industrial-arts instructor must keep abreast of the times even though he may be accused of attempting to run a five-ring circus. How much simpler it is to describe and demonstrate a sectioned model of a hydromatic transmission unit than to try to lead the class through the maze of a complicated wall chart or a textbook illustration.

As a final thought, the industrial-arts instructor may well be the logical leader to help modern youth recognize the many fallacies in our age of high-pressure advertising and rampant commercialism. We instructors assume the role of the maintenance engineer, the laboratory technician, the craftsman, and the amateur scientist, as well as the classroom teacher. We work with materials, tools, and machines as well as with children. With such a diversity of skills we cannot help but accumulate along the way a well-founded sense of values, both material and abstract.

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Making Vandyke Prints—

Reproduction of Shop Drawings—Part II

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Blueprinting and Vandyke Printing

A. *Blueprint Process*

Blueprinting was one of the earliest processes used in the reproduction of shop drawings. The term has been in use so long that it is frequently misused to refer to diazo printing. Blueprint paper is actually a white paper sensitized with iron-prussiate compounds. A positive line original is placed face up on the sensitized side of the blueprint paper. See Figure 4. Upon exposure to a light source, a chemical action takes place wherever the light reaches the sensitized surface. Protected areas such as areas under the lines on a tracing, do not undergo any chemical reaction. After exposing, a bath of clear water will wash from the paper the coating of iron-prussiate compounds which did not undergo chemical change.

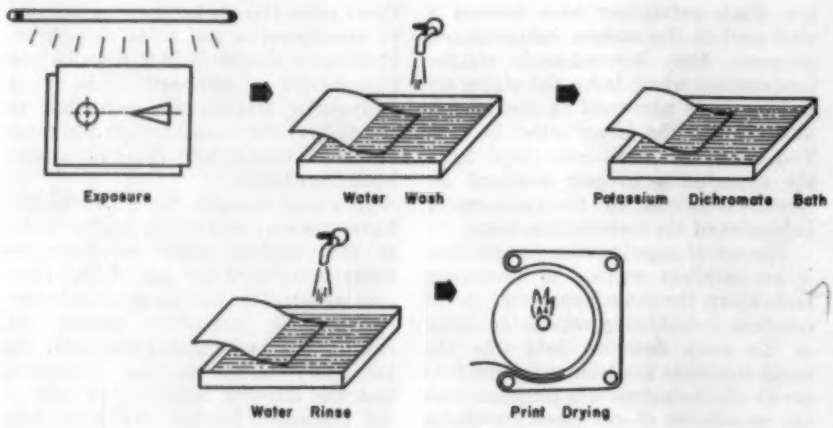

Fig. 4 Blueprint Process

This will leave the white of the paper which will then appear as the white lines of the blueprint. The blue background is the result of the chemical action of light on the iron-prussiate compounds. To intensify the contrast between the white lines and the blue background, the exposed print is dipped into an oxidizing solution of potassium dichromate. A clear water bath will prevent discoloring by washing off the excess of the potassium dichromate. To complete the process the print must be dried.

B. *Vandyke Process*

Vandyke prints are made on a special thin paper. The paper is sensitized with a combination of iron salts and silver nitrate. In exposing Vandykes, see Figure 5, it is generally desirable to place the positive line original with the lines next to the sensitized surface of the Vandyke paper. Note that this is different from the three processes described earlier. This will give a sharper line contrast and produces a reversed Vandyke negative. Exposure to light will produce a chemical change on the Vandyke paper. Areas under the lines of the original and therefore protected from light do not undergo chemical change. The print is then washed in water. This speeds the change caused by the action of light thus intensifying the background rendering it brown and opaque. To eliminate the salts that were protected from light under the lines of the original, a hypo bath of sodium hyposulphite is used. A final wash in water will eliminate all traces of the hypo bath and prevent discoloring. When the print has been dried it will be ready for use. For best results the negative Vandyke print may be treated with transparentizing solution before making additional prints from it. A positive blue line print may be made from this Vandyke negative. The Vandyke negative is used as an original and exposure is made on blueprint paper. A positive brown line print may be made using the same process on special Vandyke paper.

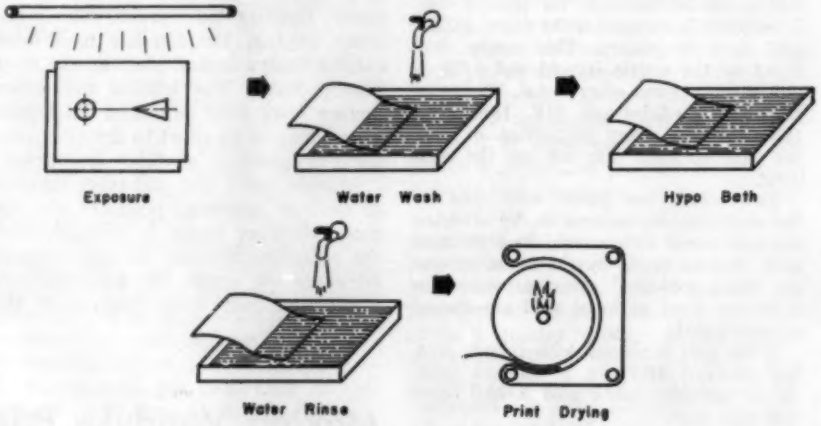

Fig. 5 Vandyke Process

Personnel Organization Should Be Made a Part of Every Industrial-Arts Program

Potentialities of a Pupil Personnel Organization

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The introduction of students to the materials, processes, and products of technology has long been a major aim of industrial arts. A more recent concern of industrial arts has been a further introduction to the ways in which technology affects American society.

A survey of nearly ninety exemplary industrial-arts programs in Ohio indicated that only about five out of nine programs made any use of a personnel organization.[1]

In its beginnings, the organization of pupil personnel may have been conceived of as a means of providing janitorial and tutorial aid. It is now hoped that such an organization serves as a vehicle through which the instructor can

[1]W. K. Sanderson, *A Study of Pupil Personnel Organization in Industrial-Arts Classes*. Unpublished Masters Thesis, Ohio State University, 1947.

organize instruction better; encourage students to participate in planning their work; allow students to share in the administration of the course; and enable students to gain certain experiences in leadership, co-operative endeavor, and social development which exemplify experiences encountered by citizens in an industrial democracy.

Traditionally the people have made the mental development of the child the primary responsibility of the schools, and the authors hold that this is still their most important single function. Today, however, most educators think in terms of the total development of the child: his physical, moral, spiritual, emotional, and mental development. Although it is now commonly held that the education of an individual is incomplete unless the individual acquires desirable social and personal traits, it must be recognized that other institutions and agencies also have a role to play in the total development of the child and that the school is merely one of many co-operating institutions and agencies seeking the same goal.

For some time industrial arts has been concerned with objectives other than manipulative skill and information. It would be difficult to find any recent statements of the objectives of industrial arts which do not in some manner mention the development of desirable personal and social traits. However in eagerness to overcome previous oversights as regards total development of the child, it should not be forgotten that skill and related information remain the backbone of the industrial-arts curriculum.

Because of the unique nature of industrial arts, it offers certain opportunities for contributing to the total development of the child not found in other areas of the school program. This does not mean that industrial arts is usurping the functions of any other curricular area. No one area has the total responsibility for developing personal traits. Each area uniquely contributes to this development. A personnel organization provides a natural vehicle through which a teacher can plan to help students develop personal and social traits. The possibilities of a personnel plan in this respect are limited only by the ingenuity of the teacher.

It must be pointed out that no two teachers would likely be concerned with developing the same personal and social traits in their respective classes, neither would the individual teacher be concerned with developing the same traits in all the students in a single class. The teacher is primarily concerned with developing those traits which appear to be lacking in a particular student. The average teacher will find occasion or need to plan experiences to help develop various personal and social traits: co-operation, self-discipline, initiative, responsibility, orderly performance, self-reliance, sound judgment, resourcefulness, altruism, loyalty, interest in achievement, respect for law and order. This is not a complete list, but it is representative of personality traits discussed in recent literature.

An Illustrative Example

Let us, for the sake of clarity, review the case of a student whose record indicated a lack of confidence in his ability which was in direct contradiction to his predicted ability. This student was highest in the class on the Stanford-Binet Intelligence Test, the Minnesota Paper Form Board, and Purdue Peg Board. Further observation supported the lack indicated in the cumulative record. In attempting to provide experiences to overcome the student's lack of confidence, he was given the position of general foreman in the personnel organization. In order to prevent this new responsibility from intensifying his feeling of inability, he was thoroughly oriented to his position. The teacher assumed a large part of his responsibility at the outset, and he was gradually encouraged to assume a greater share of the duties of his position. Through constant supervision, the student was shielded from any serious failures. As a result of this experience the student found greater confidence in his ability through recognition by his teacher and fellow students, through a new-found pleasure in exerting leadership, and through experiencing satisfactions received by co-operating in a democratically operated organization where every student shared in the responsibility for the final outcomes.

The Personnel Organization

To this point we have briefly sought agreement that: (1) one of the objectives in industrial arts is to introduce students to our technological society, (2) that such an introduction is more realistic when a student personnel organization simulating an industrial personnel organization is employed, and (3) that the personnel organization offers unique and valuable teaching opportunities. Let us now shift to a discussion of some features of a fully developed student personnel organization. In the first place, any comprehensive personnel organization has these broad general purposes:

1. To alert students to the factors at work within labor and management through participation in some representative personnel organization which deals with the problems faced in our industrial society.

2. To acquaint students with the operation and benefits of the free enterprise system.

3. To provide opportunities for increasingly higher levels of democratic behavior in each child.

4. To help students understand how industry is organized and managed.

A student personnel organization designed to attain the foregoing objectives will be based upon certain general characteristics determined by our democratic and industrial society and should be adaptive to modern teaching methodology.

A personnel plan which is to reach the objectives as previously stated should observe the following general principles concerning the development, operation, and evaluation of the personnel organization.

A. *Informed and Enthusiastic Teacher.* It perhaps is trite to point out that the teacher must be cognizant and appreciative of the values of a personnel organization and must willingly spend the time necessary to become informed as to the problems involved in organizing and operating a functioning personnel plan.

B. *Informed and Enthusiastic Students.* The natural enthusiasm of youth is easily captured with the idea of being able to participate in an organization which offers them an opportunity for leadership, for having a voice in the class government and emulating the grown-up activities of adults in industry.

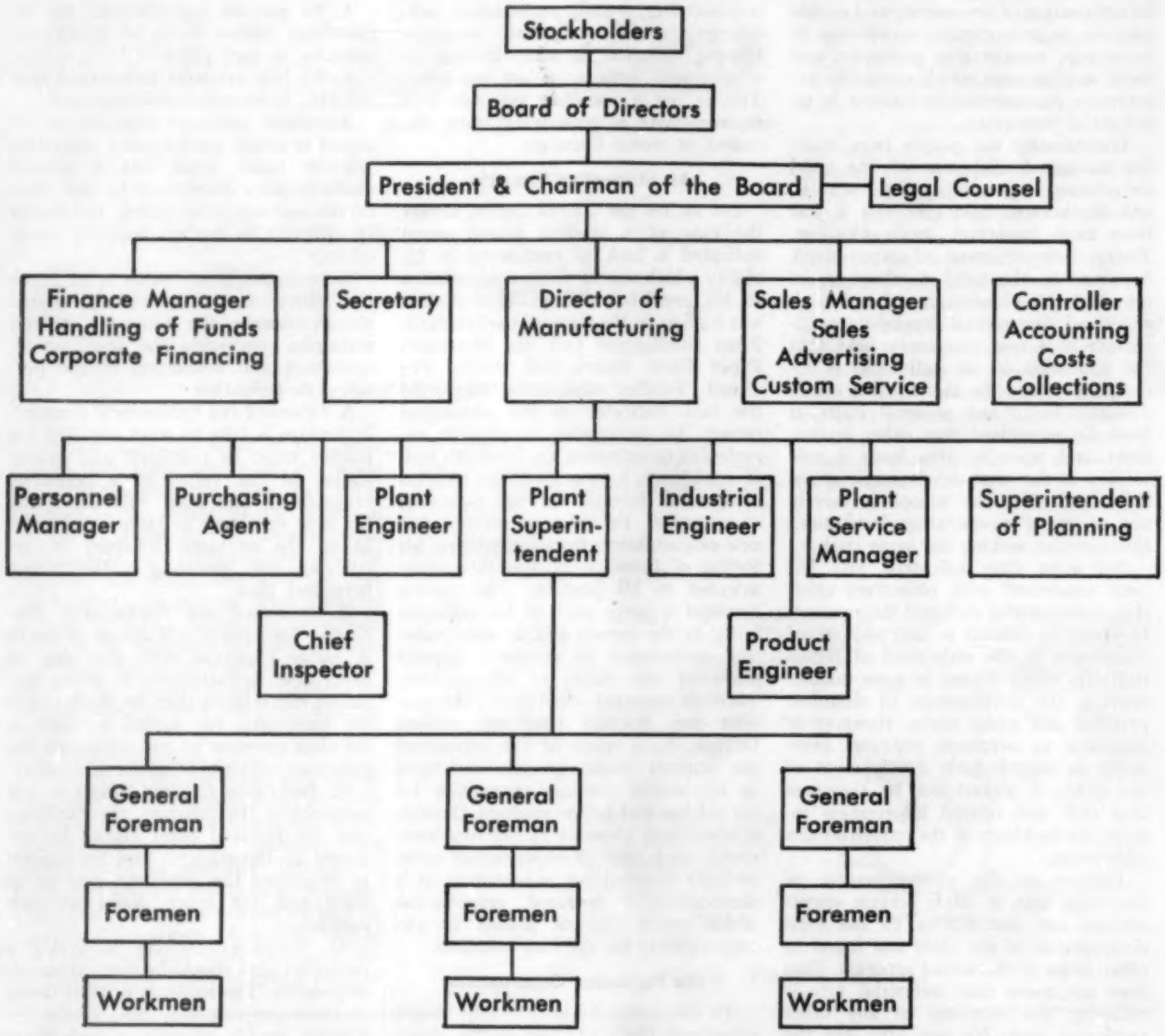
C. *Analysis of Existing Situation.* The purposes of the program, the facilities, and the physical plant should be analyzed by the students and the teacher to determine the necessary jobs to be filled and the exact duties of each position.

D. *Simplicity.* At the beginning a personnel plan should be kept as simple as possible. The students in their desire to make projects may not, at the beginning, see the necessity of such offices as personnel director, librarian, public relations director or safety director. The teacher should gradually, in working with the students, point out the need for other jobs and help the students develop a feeling for the needed extension and elaboration of the program.

E. *Line and Staff Organization.* The teacher in order to help students develop a better understanding of personnel organization, should explain the characteristics of each type of personnel organization in business and industry, i.e., line functional, and line and staff.[2] Figures 1 and 2 present typical *line* and *line and staff* organizations. The functional type organization, which has each supervisor or

[2]Richard N. Owens, *Management of Industrial Enterprises*, Richard D. Irwin, Inc., 1953, 43 pages.

LINE AND STAFF ORGANIZATION*



*Owens, Richard N., Management of Industrial Enterprises, p. 46.

Fig. 2. More complete and detailed organization chart

foreman in charge of a function as the executive in charge of that function, is too unsuited to school purposes and too little used to be presented here.

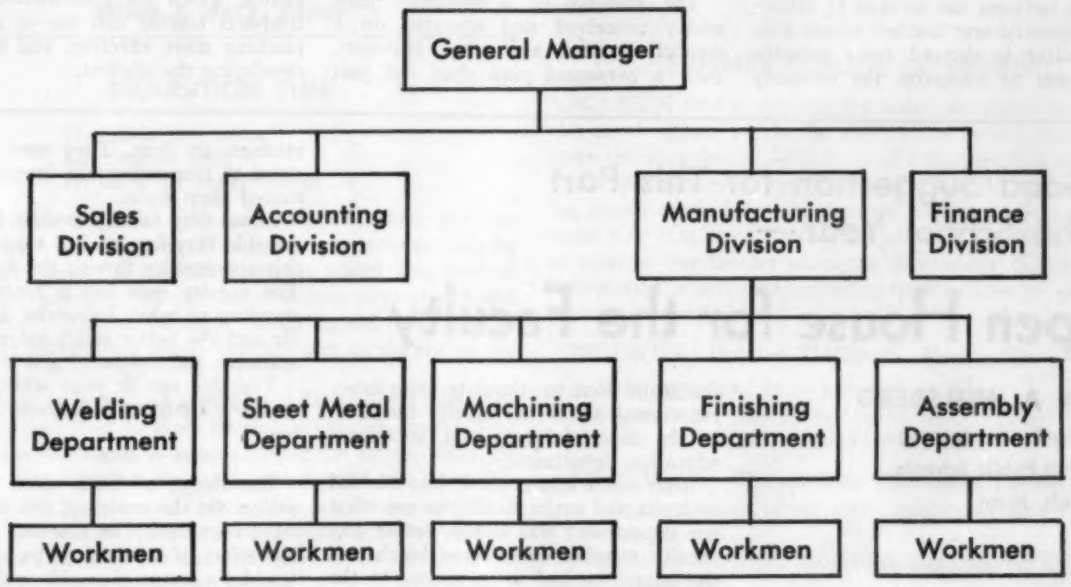
The line and staff organization, supplemented with committee organization, is the most adaptive to the school laboratory, in addition to being the form most commonly used in American industry. The line part of the organization gives the stability, efficiency, safety, and discipline to the organization, while the staff provides the necessary functions of planning, service, procurement, and evaluation. It is interesting to note that this type of organization exercises the necessary vertical controls and still stimulates a wide variety of specific functions, all interrelated in an on-going, functioning organization.

The Junior Achievement Movement implements all areas of the organization, as shown in Figure 2, in actual practice; and youth participating in financing, production, sales, and administration unquestionably have a fuller understanding of the free enterprise system than those reading about it in books.

F. *Flexibility*. A personnel organization should be flexible. Students should be rotated in certain jobs but not necessarily all of them. The process of rotation should not be standardized, but must suit the needs, abilities, and interest of the students. It is assumed that this flexibility will permit the students to have more freedom, but it is also believed that they will quickly learn to assume this newly gained freedom if the teacher is both sincere and able.

In addition to these general principles to be observed in the planning and management of a personnel organiza-

SIMPLE LINE ORGANIZATION*



*Owens, Richard N., Management of Industrial Enterprises, p. 161.

Fig. 1. Simple organization chart

tion, there are certain administrative aids which need to be considered.

A. *Organization Chart.* The teacher and the class should work out an organization chart which shows the channels of responsibility and authority. Thus each member of the class can readily determine the part he is to play in the enterprise.

B. *Job Specifications.* The organization chart shows the positions and relationships of each activity, but something more is needed. An organization manual or job specification index is essential to the smooth operation of the personnel plan. A job specification as shown in Figure 3 defines each position, establishes the duties, and shows the relationship to other positions.

C. *Cumulative Records.* Any attempt by the teacher to plan experiences that may develop personal and social traits which appear to be lacking in students would be ineffectual without a complete, up-to-date record of the student's accomplishments and traits. Many schools now use a comprehensive cumulative record to provide such information for the school staff. The industrial-arts teacher should avail himself of this data in the selection and placement of students in the personnel organization. If the school does not keep a cumulative record of its students, the industrial-arts teacher should devise one suited to his needs.

SELECTED EXAMPLES OF JOB SPECIFICATIONS FROM THE JOB SPECIFICATION INDEX

Job Title: General Superintendent
Nature of Work: The general superintendent is concerned with the total activity of the laboratory. Helps coordinate the operations, acts as liaison between individuals and areas with the board of directors and the instructor, and directs the supervisors in the execution of their duties.
Responsibilities: The general superintendent is charged with the responsibility of executing the policies of the board of directors.
Selection Factors: Exceptionally good attendance, emotional stability, above average mechanical ability and intelligence, reliability, analytical and organizational ability, and ability to get along well with others.

Job Title: Personnel Director
Nature of Work: The personnel director keeps all the suggested records such as absenteeism, tardiness, job specifications, and student activities records. He promotes class activities such as picnics and attendance contests, and serves as liaison between individuals and management. He helps in the selection and placement of individuals in proper jobs.
Responsibilities: The personnel director is charged with keeping individual's records and the placement, and welfare of the individuals as well as the welfare of the total personnel.
Selection Factors: Good attendance, ability to get along with others, an interest in clerical work, and an interest in class activities.

Fig. 3. Examples of Job Specifications

Most cumulative personnel record cards have space for the following: (1) personal history of the pupil, (2) health record, (3) scholastic record and activities, (4) psychological data, (5) reports of all interviews pertaining to the pupil, (6) notes on the home environment, (7) special abilities, (8) interests, (9) disinclinations, and (10) personal observations.

D. *Activities Record.* Once the personnel plan is operational, some means of recording each individual's daily activity is necessary. The procedure used is comparable to time keeping and production analysis procedures used in industry. The authors have used a large 22 by 30-in. chart with each student's name listed in the left hand column in alphabetical order. Columns to the right are provided for each day of the course. This space should be large enough for an explicit and daily brief entry of the activities of each student by the activities record clerk. This type of chart provides a more complete account of each student's progress than the ordinary progress chart.

Summary. Industry long ago recognized that one person can direct the activities of large numbers of workers only by utilizing the services of others. The industrial-arts teacher whose subject matter is derived from industry also needs to recognize the necessity for an organization to improve the effectiveness of the management of the laboratory.

The rewards of a personnel plan wisely conceived and operated on a democratic basis are many. However, such a personnel plan does not just happen — it takes time, hard work, and much planning. The personnel plan is not a cure-all. It is just one more vehicle which the conscientious industrial-arts teacher can use to make his teaching more effective, and to aid in developing the student.

A Good Suggestion for This Part of the School Year —

Open House for the Faculty

JOHN A. HIELSBERG
Building Trades Instructor
Faribault Public Schools
Faribault, Minn.

Attention! Are your relations with the rest of the faculty of the best type?

The shop men at Faribault Public High School decided that something should be done to stimulate more interest among all of the faculty members in the industrial arts and vocational education department.

After much discussion it was decided to invite the entire faculty to see what our department was doing. Before any faculty member could have lunch "on the house" he had to go around to the various shops, see displays, equipment, courses of study, and boys in action.

As the faculty members visited each shop their invitation was punched by students on duty. They were then entitled to free coffee and doughnuts furnished shop style.

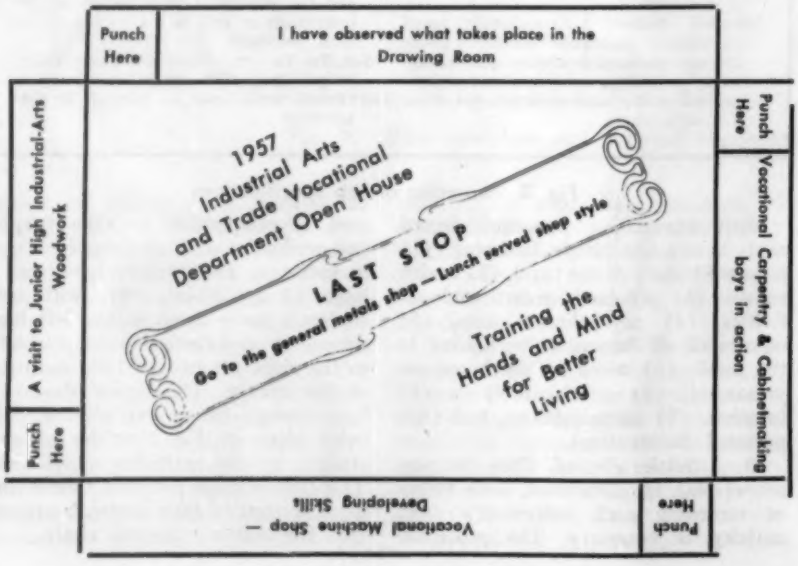
About fifty faculty members out of a possible fifty-five availed themselves of this opportunity to visit the four shops. The faculty now has a better understanding of what industrial arts stand for and the better relationship between academic and industrial arts is amazing.

Try this out in your school. It has meant a lot to us, and could help you, too.

The Shop Department
Invites YOU
To an Open House

WEDNESDAY — FEBRUARY 20, 1957
3:15 to 4:00 o'clock

To assure a well-rounded tour, have the attached card punched and then have lunch with us in the general metal shop.


Punch Here
I have observed what takes place in the Drawing Room
Punch Here
Vocational Carpentry & Cabinetmaking boys in action
1957 Industrial Arts and Trade Vocational Department Open House
LAST STOP
Go to the general metals shop — Lunch served shop style
Training the Hands and Mind for Better Living
A visit to Junior High Industrial-Arts Woodwork
Punch Here
Punch Here
Vocational Machine Shop — Developing Skills

Knowledge of truth alone does not suffice. On the contrary, this knowledge must continually be renewed by ceaseless effort, if it is not to be lost. It resembles a statue of marble which stands in the desert and is continuously threatened with burial by shifting sand. — *Albert Einstein.*

The knot that falls out of wood you are working on can be put back in its place. Dip the knot in fresh, pure shellac that has been thinned and put it back. The shellac will not only hold the knot in place but will seal in the resin. — *Shellac Information Bureau.*

Watch your step, because falls are costly. Falls from different levels frequently result in death or serious injury. In industry, compensation payments for falls are substantially higher than those for other accidents. — *Facts About Falls.*

World's largest wind tunnel has been opened at Arnold Engineering Development center, Tullahoma, Tenn., to produce 3800 mile-an-hour hurricane gales in testing supersonic aircraft and guided missile equipment. Machine incorporates four Westinghouse motors totaling 216,000 horsepower. — *Industrial Research Newsletter.*

The Army estimates almost 109,917 soldiers are enrolled in 130,725 United States Armed Forces Institute courses; about 29,000 enrolled in 50,420 group study classes; and almost 7500 in 9734 civilian school courses. Thus, about 161,000 are actively completing their education while in the service. — *Wisconsin Military Information Section.*

Industrial Arts and Vocational Education

JOHN J. METZ, Editor

REQUISITION TIME

"The time has come
The walrus said,
To think of many things . . ."

EVIDENTLY the huge arctic animal about which this was written was not thinking of writing requisitions, but he might have been, for the shop teacher about this time of the year is confronted by the job of writing requisitions, and that makes him think of many things indeed, even though he has numerous other things that tax him as the end of the school year approaches.

Of course, if he has organized an industrial-arts inventory such as is described in Jules Bertin's article on page 143 of this number, his work of requisitioning the things which he needs in his shop for the next school year will be much easier and less bothersome. If you have not inaugurated such a system as yet, this is a good time to start planning so that you will not be caught short next year when you have to prepare your own requisitions.

While we are on this subject, it might be well to mention a few precautions which it is well for the writer of a requisition to observe. For instance, the teacher may need certain tools, but does he know how to recognize the value of the tools that he sees in the show windows of the hardware store, or in the catalog of the manufacturer, or the advertisement in the magazine which he reads? Requisitioning these tools on price alone is not very scientific. The teacher must know what he wants and write his requisition accordingly.

Then there is the matter of service. Is the requisition made out on a dealer or manufacturer who is reliable. It is well to look through the advertising section of this magazine and see what those who advertize in your professional magazine have to offer. Many of our advertisers have been with us for over forty years. Their reliability is unquestionably good. They know your field well, and they patronize your convention where they show their wares and help you to finance your annual meetings. Give them a chance at helping you in your shop.

Best wishes to you with your requisitioning job for 1957 and the years ahead.

ARISTOCRATIC BRICKS

ORDINARILY when one speaks of bricks it is with a sort of derogatory air. When one realizes, however, that the steel industry spends about $1.50 on them for every ton of steel ingots produced, the picture changes. These are not common bricks, of course. The conditions under which they have to function are very severe. They must not only be very strong but they also must be able to stand extremely high heat, because the industry is continually finding ways to use more intense heat in making its products. This requires bricks that are able to resist extremely high temperatures, and since one large blast furnace may require over two million in its construction and almost another million in its auxiliary stoves it is easy to understand that it cost the steel industry more than one hundred thirty-two million dollars in 1954 for refractory bricks. This did not include the cost of handling and installation.

Most of us do not even know that such expensive bricks exist.

SUMMER SCHOOL OFFERINGS

VACATION time is approaching apace, yet encumbered with the many duties which the end of the school year places upon the shoulders of instructors of industrial arts and vocational teachers, some may have overlooked the need of making arrangements for summer school attendance. It is to assist these men that the following list of summer schools, offered at some of our teacher education institutions, is given. The information is arranged according to the states in which the schools are located.

ILLINOIS. Bradley University, Peoria, Ill.
First term, June 14 to July 20.
Second term, July 22 to August 24.
Write to Director of Summer Session.

MICHIGAN. Wayne State University, Detroit, Mich.
Summer sessions of six, eight, and/or ten weeks to start on June 24.
Write to Industrial Education Department, College of Education.

MINNESOTA. University of Minnesota, Minneapolis, Minn.
First term, June 17 to July 20.
Second term, July 22 to August 24.
Write to Dean of Summer Session, 713 Johnston Hall.

NEW YORK. State University of New York, Teachers College, Oswego, N. Y.
Summer session, July 1 to August 9.
Write to Director of Summer Session.

New York University, Washington Square, N. Y.
Intersession, June 4 to June 28.
Summer session, July 2 to August 9.
Post session, August 12 to September 6.
Write to Vocational Education, Dept. 55, School of Education.

OREGON. Oregon State College, Corvallis, Ore.
Summer session, June 17 to August 9. Two 4-week terms.

PENNSYLVANIA. The Pennsylvania State College, State College, Pa.
Intersession, June 10 to June 28.
Main session, July 1 to August 10.
Post session, August 12 to August 30.
Write to Director of Summer Session, Room 102, Burrowes Building.

WISCONSIN. Stout State College, Menomonie, Wis.
Pre-Summer Session Workshop, June 17 to 21.
Main session, June 24 to August 2.
Post session, August 5 to August 16.
Write to Director of Summer Session.

Milwaukee School of Engineering, 1025 N. Milwaukee Street, Milwaukee, Wis.
Engineering — B.S. degree — 36 to 42 months.
Engineering Technician — AAS degree in electrical or mechanical technology — 18 months.

A New Experiment for Industrial Arts

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The Milwaukee Downer College
Milwaukee, Wis.

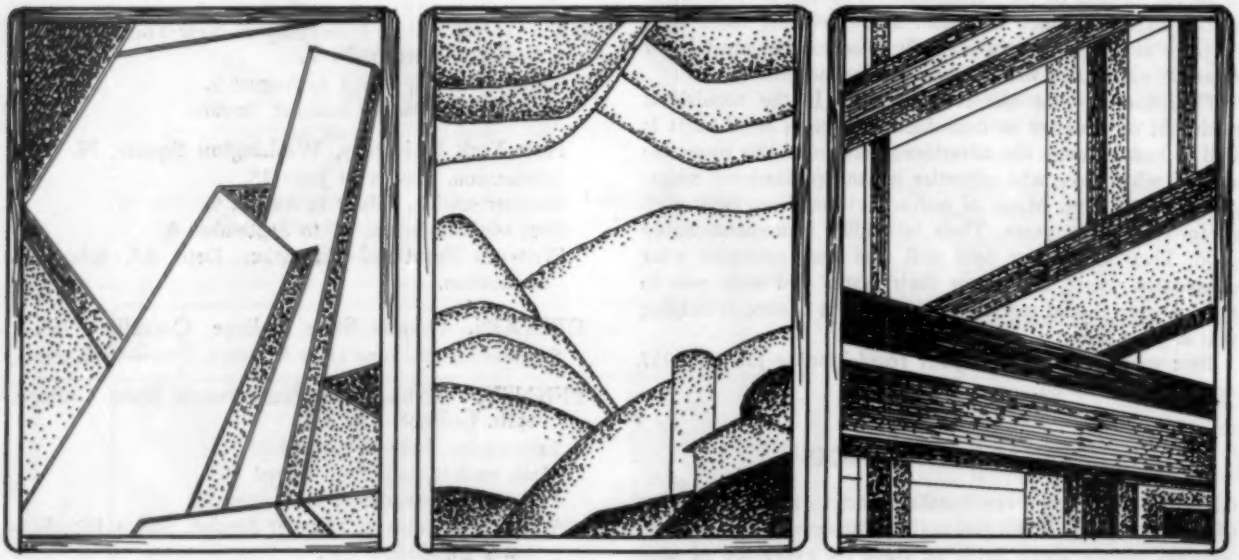
The Relationship of the goal to Design in the Shop

My first manual training experience was in 1902. The shop which I entered had already mellowed from many years of use. As I remember, it was a pleasant place, clean, and odorous of woods. However, nothing else of the episode remains except the memory of projects which, even then, were deemed useless. Among them were a coathanger, a bootjack, and a footstool. The latter was of a kind we call *tavern* type today. We do have the proclivity in our times of attaching catchy names to otherwise distasteful commodities in order to hide their frank ugliness. In our day, we had no name for the footstool: we just dubbed it *bench*.

The footstool came to us from years previously. I would guess it appeared in manual training shops in the early 1890's.

Then, to see this uninspired bench boldly taking room in our shops in this advanced scientific age is perplexing, if not alarming. Is industrial arts not making a grave mistake when it tells its story so publicly? May the public not take the footstool on its face value, seeing in this obsolete product a poverty-stricken complex that, to be condoned, must be the true tone of the department throughout?

The footstool is but a symbol of a state of consciousness. To be frank and honest, it is not representative of our department.



Open desk pin tray

It, and other items of little or no value, have no place in modern education.

Any analyst, professional or not, and you, if you could see your shop through the consciousness of an impersonal surveyor, could tell quite readily why misrepresentative projects persist through seventy or more years of shop work, and why the shop has advanced so little from its first years in the matter of classroom subject matter and method of presentation. Plainly, there is a basic fault; and because of it, and since poor design is a mere symptom of the fault, to try to correct design without correcting the fault, is not correcting design at all. Effort to raise design standards, therefore, is all but futile unless industrial-arts objectives, subject matter, and teaching material are raised to practical levels in terms of the advanced age.

Many will agree to this, and many will have feelings that these deductions may be right, but many also will be ready to take strong exception to the conclusion given. The latter group, however, are on the losing side: there are too many positive evidences that our stated aims are impractical and out of tune with the times. Design is merely one evidence. Our so called progress is in large measure only a multiplication of shop types, but in all of these, the actual shop presentation, the conduct of the shop, shop subject matter, the teacher's purposes, his objective, his method of teaching, his immediate product, and the over-all department product, has not changed in the average shop. The world has changed. Transportation has changed. Communication, home life, industry, leisure time, commodities, design: all have changed.

I have met many who concur in these observations. They are ready to do something about changing the program.

This article proposes an approach to change:

1. Through workshops, on the training college level.
2. Through demonstrations and symposia, on the leadership level.
3. Through tryout classes in shop programs, on a teacher level.

There are many angles to the problem of change, as can be readily understood; and it is further the consensus of opinion that nothing short of a workshop can deal with all angles properly, so that new goals are thoroughly rated, and so that practical teaching methods and materials are devised to meet the new ends.

As an example of new subject matter, the remainder of this article will be given to an actual review on grade 8 level, of an experiment in progress as this article is written. It had its beginnings in more than a half dozen other tryout courses, this one being a part of an extended and more comprehensive effort to find the elements in a contemplated change.

The Purpose of This Approach

To try out tentative theories, projects, approaches to teaching, subject matter, methods of teaching, etc., toward meeting the ends of a new goal for industrial arts — to build a renaissance in America.

Industrial-arts courses that create ego-centered interests, purposes, skills, desires, and mental concepts are abyssmal waste.

Student effort, directed beyond ego, into a world of service, is the goal of industrial arts. Students must be given the mental pictures of that which they are to build. Therefore, the work of industrial arts is to build mental pictures of that *which is to be.*

The result of ego training and shallow schooling weighs heavily upon our times. Weakness and the willingness to condone the loss of liberty (in the American sense) is general. There must be gratitude for our incomparable heritage in order to possess the heritage. Industrial arts is better fitted than other departments of education, to give to students that *drive* toward which this goal directs them.

Mass produced competitive commodity production is but one of the subjects that has been tried. Alone, it is incomplete and will not reach out to the breadth of the stated goal. It is an important member of a group of subjects. Together, the proposed subjects complete the picture of a renaissance in America.

Selection of Subject Matter

The source material to be offered for reaching the new goal is to be found within the area of possible learning with which the general public is not now familiar, but which industrial arts may teach with greater facility than other educational departments. Much that should be general education today is hidden from the public in a mass of specialized education, or in areas that educators have not as yet recognized as general need. The subject given, i.e., mass produced competitive commodity, for example, is understood by few citizens, and the lack of a clear view has been the cause of much strife, general misunderstanding, monetary loss, suffering, and unfounded hatred. This can be greatly minimized through the study.

Conduct of the Experiment

1. Scout the market, and design a salable, high quality, small commodity that may be sold through an interior designer's shop to a select clientele.
2. Produce the commodity by the mass production method.
3. Produce on a monetary basis, under the control of a student-organized and conducted business setup, for profit.

Student Activities

1. *Business organization:* officers; discussion of a profit-based shop setup; consideration of capital; supply; cost; wastes and losses; production problems; the factor of time, and therefore jigs and fixtures; assembly; wrapping; the selling organization; profits; etc.
2. *Selection of the commodity:* scouting the market demand; scouting the distributor; designing; research in styling; etc.
3. *Tooling:* Shop setup for quick take-down. Special tools and fixtures; etc.
4. Manufacturing organization (through packaging).
5. Production (through shipping).

The Commodity

Selection is of course, teacher-directed. Students are still learning.

The requirements are:

1. Attractiveness to the consumer (and to the distributor).
2. Functional desirability.
3. Newness of idea (remote from copying).
4. Up-to-the-minute styling. In the trend concept of design.
5. Professional appearance and workmanship.
6. Pleasing color, texture, and finish.
7. Material is new, if there is a choice.
8. Design and method of production within the scope of shop work.

The final choice of commodities which fit the specs. were an open desk pin tray made so that it might, by the addition of a ring, be used as a wall picture. Both are identical in size, made of ⅛ by ¾-in. walnut strips cut to 3⅛ and 4½-in. lengths. These are glued with butt joint to make 3⅜ by 4½ in. frames, O.D. Further procedure is as follows:

1. Coat window glass with wax and polish.
2. Coat the waxed surface with a thin film of Castoglas resin.
3. Inspect frames and clean off glue where necessary.
4. Set frames into the wet resin, which when set makes each frame a receptacle.
5. While the resin is still "tacky" add more clear resin to make the total resin thickness about ⅛ in. inside the frame.
6. Allow the resin to gel and add the design while it is still tacky. This requires that the design is worked out prior to resin pouring, and that materials for the design application are ready at the proper moment. Add the design as follows:

Design in illustration 1

Short lengths of 1/16-in. polished brass wire provide the outline for the design. Lay these into the frame over the gelled resin with tweezers. The brass is not secured in any way. Fill the spaces between the brass wire with pigmented resin to an approximate depth of 1/32 in. The colors are shades of transluscent blue; dark, medium, light, and very light. Finish the wood with linseed oil and wax. Polish plastic if necessary. Remove from glass with a sharp chisel and trim.

Design 2

Lay penciled design under the glass. Add pigmented resin design while the plastic is still tacky. This is flowed on and spread carefully with a mixing stick, beginning in the center of the design and working with successively deeper and deeper shades of color toward lower and upper ends. The hills and buildings should be dark, medium, and light shades of blue-green and sienna, and the sky light blue, very light, and very very light. The high edges of colored applications build up to approximately 1/16 in. at their leading edges, from which point they thin down until they reach the area of the succeeding application. The thinned area being more transparent than the thicker, the picture gains an ethereal effect. Color shade variations are obtained by adding pigment to base mixtures of resin, and not by mixing shades separately. Starting with the light shade is preferred.

Design 3

As in design 1 where brass wire outlines were set into tacky resin, in design 3, narrow strips of rare wood veneer in addition to polished brass wire are used for design outline. The wood strips are set into a thin coat of wet plastic to eliminate bubbles under the wood. A last coat of clear resin is applied to cover wood and wire completely.

Wood frame is oiled and waxed as before, and the resin is buffed if necessary.

Conclusion

Just before the end of production, a selling problem looms before the group. Part of the students visit dealers with the first product. They meet typical opposition. One dealer has enough trays, though he likes these. Another, already having plenty on hand, takes three to see how they will sell. Another takes two. Still another says he does not buy such merchandise: he handles everything on consignment. Thus, they sell five. They have 100 to sell. The group returns, and the class has a business session. Questions are: Shall they consider selling on consignment? Shall they dispose of the entire lot to a wholesaler at 2/3 off? Shall they sell to a large retailer at 1/2 off? Shall they retail direct at full price? Possible retail outlets, advertising, cost of selling, compensation for salesmen, and does it pay to sell retail?

What do the students learn here? What do they learn from the entire area? The answer is: they gain firsthand knowledge that most citizens have little understanding of: knowledge of market requirements, design requirements, manufacturing problems, cost of selling, small margin of profit, the monetary concerns of industry, etc.

Thus, skills are multiplied. Skills come into their right use when they become a means in the learning process. Learning also comes into its right use when it leads the student away from emphasis upon himself and when it directs him to realms of service and building in an endeavor to build a renaissance in America.

GOLF BAG CART

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Observation of activities on the golf courses of today indicates that mechanization has taken place there just as in many other forms of modern living. Golfers either pull their bags and clubs on some form of two-wheel cart or carry them as well as themselves on an electrically propelled vehicle. Since the carts are so widely used, it would seem a metal-shop project of this nature would prove quite popular among students.

The cart described herein is very serviceable for several reasons. First, it is made of all-steel, welded construction which gives ample durability. Second, it is compact in that it can be folded into a package very little larger than the bag and clubs. Third, the design is such that it will not tip and fall when set on uneven ground which is encountered on many golf courses. Fourth, because of simplicity of design, the weight is comparable with aluminum models which are on the market.

Materials used for the project are of the simplest form and are found in most school metal shops. The post, post bracket, and handle, are made of black iron pipe which lends itself well to welding. Legs and leg plates are made of angle iron. Axles and lock pins are made of cold-rolled steel and drill rod respectively. The other major parts are made of standard size bar stock. The parts which are to be purchased (such as wheels, springs, bolts, rivets, etc.) are of standard size and can be obtained from a retail hardware store. Since common materials are used the total material cost should not exceed $6.

There are many varied operations involved in construction of the project. It is possible to complete all operations, except the ones involving drilling, without the use of metalworking machines. There is ample opportunity to employ a wide variety of welding operations including flame cutting, gas welding, gas brazing, and arc welding. The hand metalworking operations include sawing, filing, cold and hot bending, riveting, and drilling. In addition to the metalworking and welding operations there is a great deal of experience to be gained in accurate layout procedures.

Procedure

Leg and Wheel Assembly

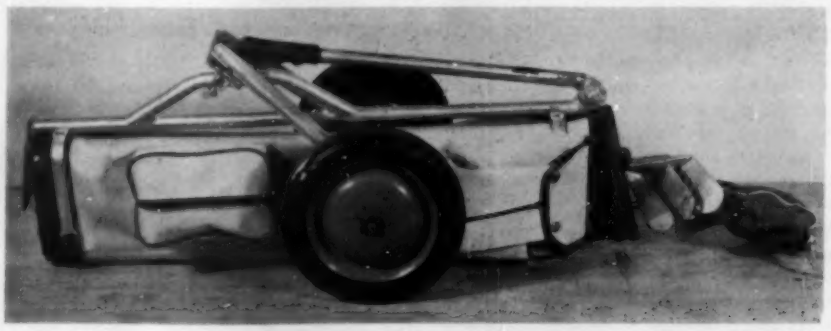
I. Legs: (*a*) Saw to length. (*b*) Round corners and edges with a file or grinder. (*c*) Locate and drill rivet holes.

II. Leg plate: (*a*) Lay out shape of part. (*b*) Flame cut or saw to shape. (*c*) Round corners and edges with a file or grinder. (*d*) Locate and drill leg rivet holes. (Lock holes will be drilled after legs are riveted in place.)

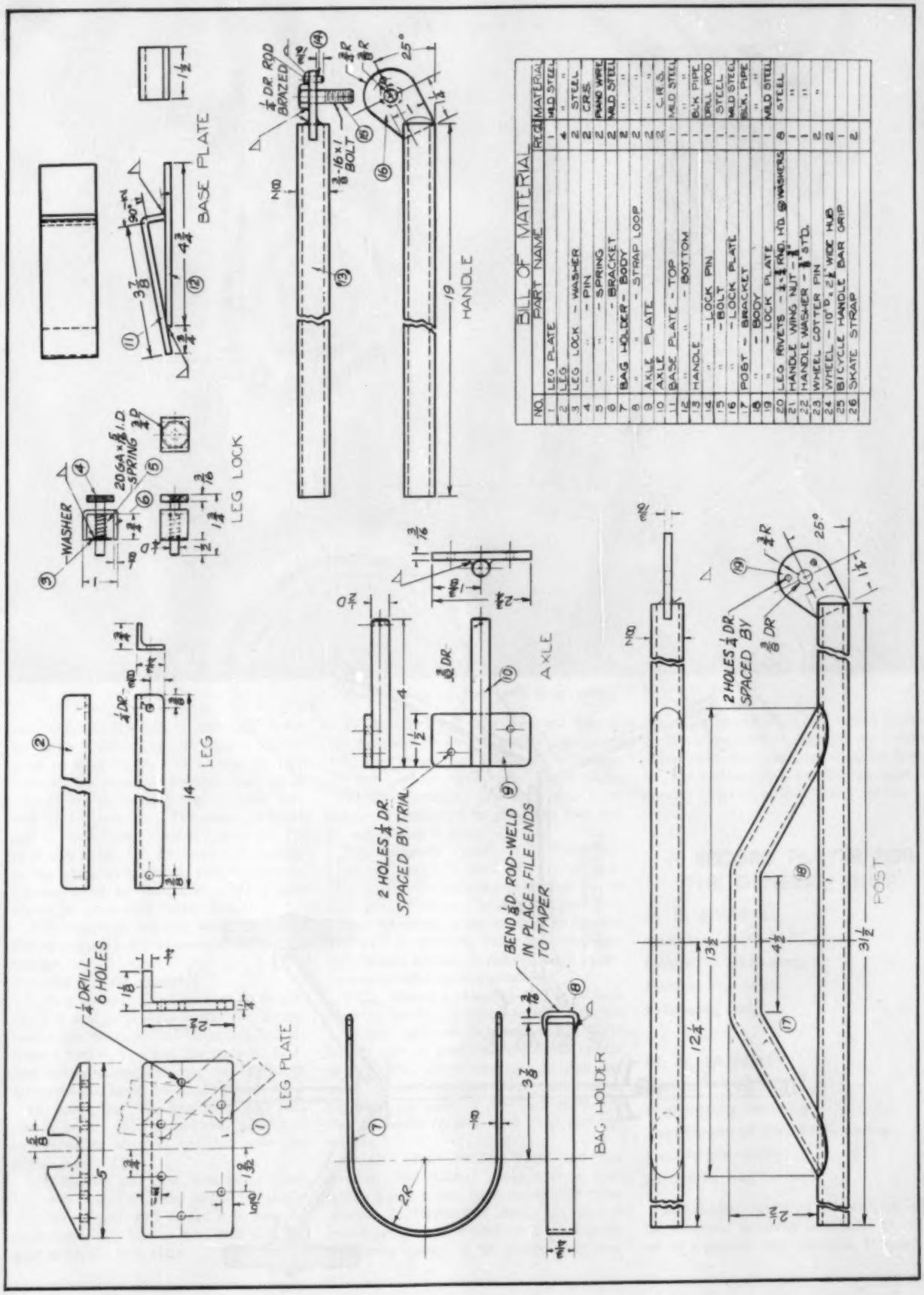
III. Axle plates: (*a*) Saw to length. (*b*) Round corners and edges with a file or grinder. (Holes will be located and drilled, axle will be welded in place after completion of leg and wheel assembly.)

IV. Leg lock: (*a*) Cut and bend leg lock bracket. (*b*) Locate and drill hole in bracket. (*c*) Turn and drill hand wheel. (If lathe is not available, part may be sawed and filed to shape.) (*d*) Cut drill rod to length. (*e*) Bronze weld washer in place. (*f*) Assemble with spring in position and bronze weld hand wheel to drill rod. (Spring must be kept cool while bronze welding hand wheel.)

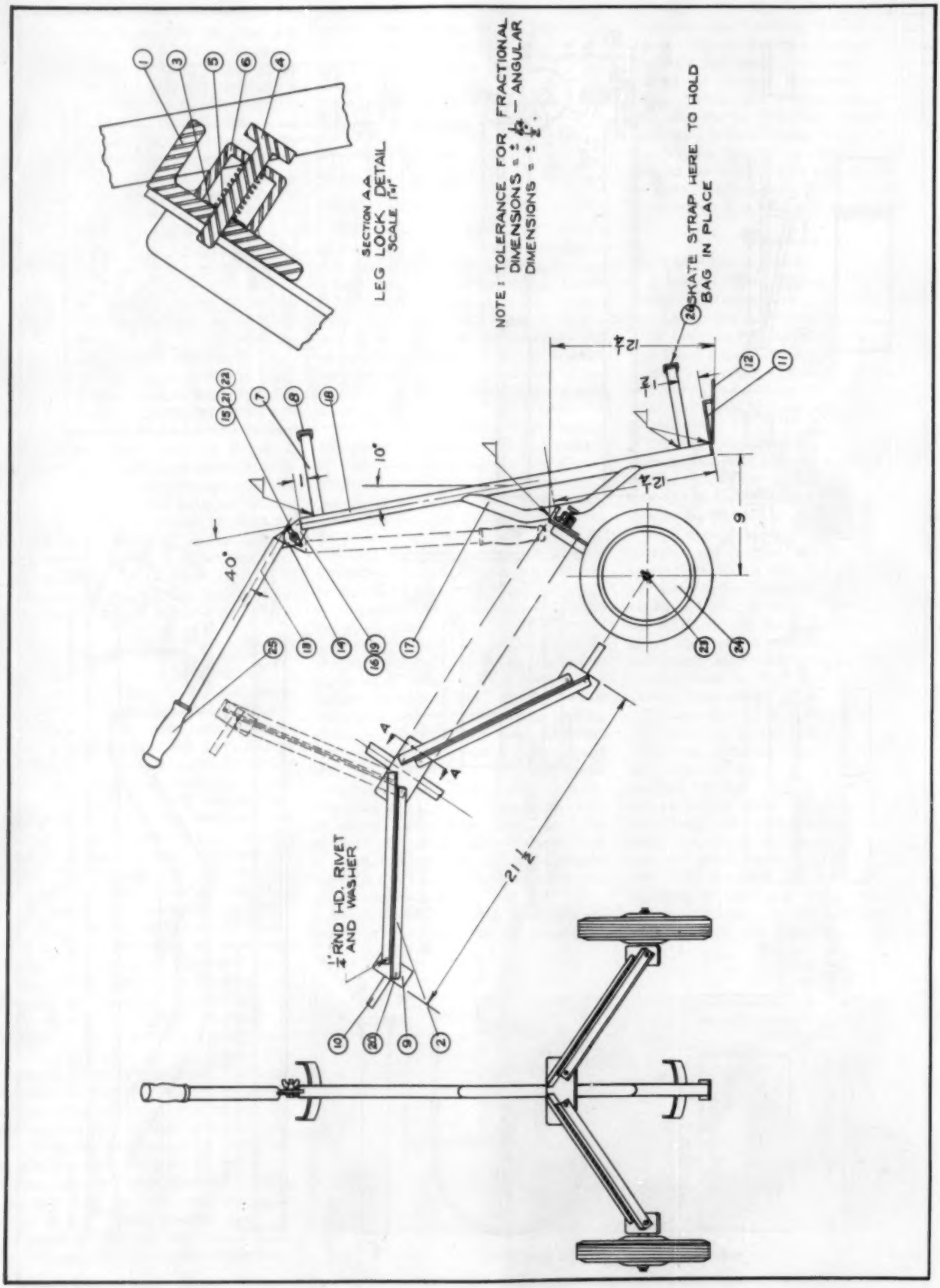
V. Assembly: (*a*) Rivet legs to leg plate. (*b*) Place legs in full down position and clamp axle plates in place. (Square with top surface of leg plate.) (*c*) Mark hole positions through holes in legs and drill axle plates. (*d*) Rivet axle plates in place. (*e*) Clamp 1/2D. cold-rolled rod to axle plates. Rod should be long enough to form axles and reach between plates as a single unit. (The one-piece axle rod will assure alignment of axles after center has been cut out.) (*f*) Saw axle rod flush with the inside of each axle plate. File edges of



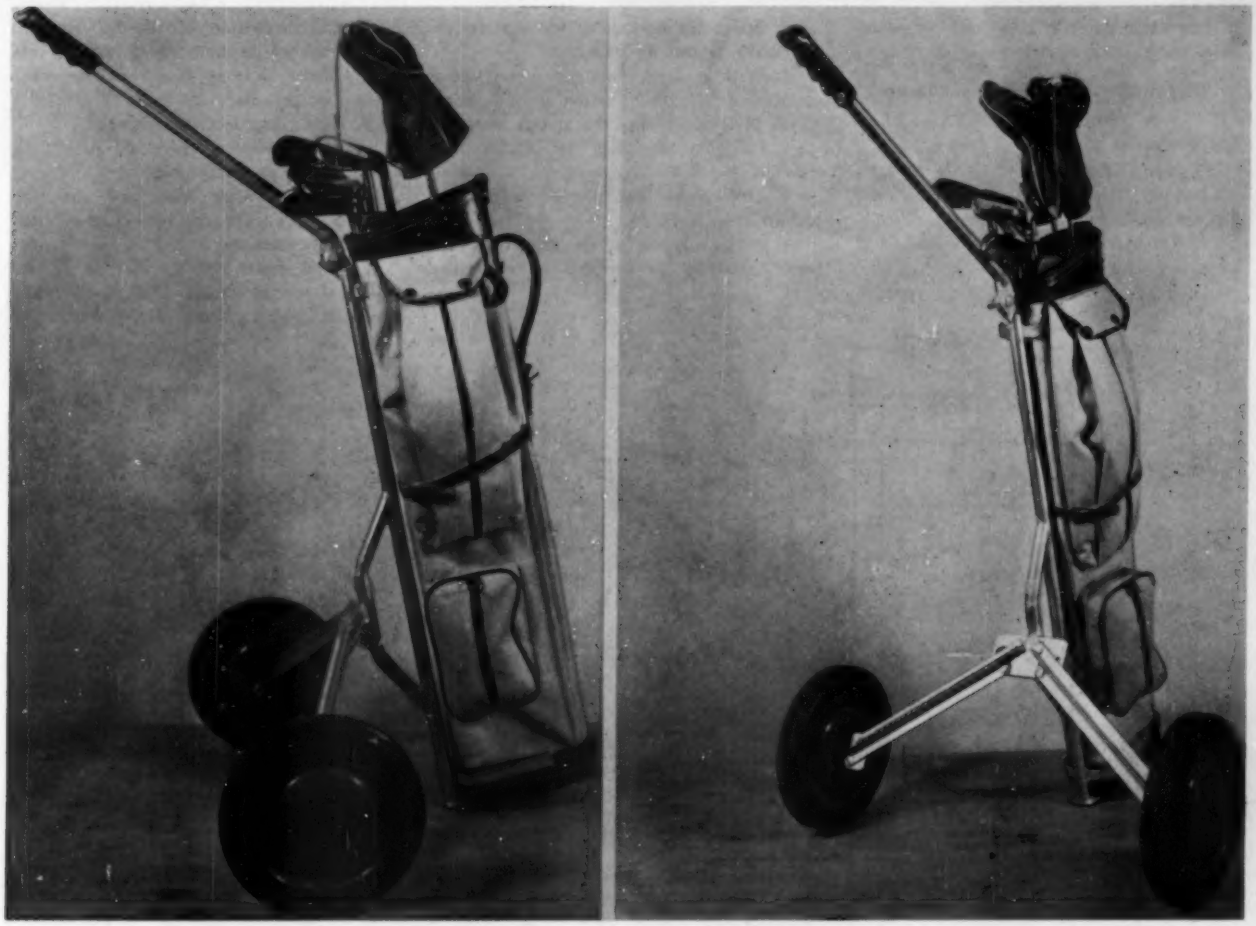
Golf bag cart by Byron E. Graber


BILL OF MATERIAL
NO. PART NAME REQ MATERIAL
1 LEG PLATE 1 MLD STEEL
2 LEG 4 " "
3 LEG LOCK - WASHER 2 STEEL
4 " - PIN 2 CRS.
5 " - SPRING 2 PIANO WIRE
6 " - BRACKET 2 MLD STEEL
7 BAG HOLDER - BODY 2 " "
8 " - STRAP LOOP 2 " "
9 AXLE PLATE 2 C.R.S.
10 AXLE 2 MLD STEEL
11 BASE PLATE - TOP 1 " "
12 " - BOTTOM 1 BLK PIPE
13 HANDLE 1 DRILL ROD
14 " - LOCK PIN 1 STEEL
15 " - BOLT 1 MLD STEEL
16 " - LOCK PLATE 1 BLK. PIPE
17 POST - BRACKET 1 " "
18 " - BODY 1 " "
19 " - LOCK PLATE 1 MLD STEEL
20 LEG RIVETS - 1/4 RND. HD 8 STEEL
21 HANDLE WING NUT - 3/8" STD. 1 "
22 HANDLE WASHER - 3/8" STD. 1 "
23 WHEEL COTTER PIN 2 "
24 WHEEL - 10" D. 2 1/2" WIDE HUB 2
25 BICYCLE HANDLE BAR GRIP 1
26 SKATE STRAP 2
BASE PLATE
HANDLE
LEG LOCK
WASHER
LEG
LEG PLATE
AXLE
BAG HOLDER
POST
2 HOLES 1/4 DR SPACED BY TRIAL
BEND 1/8 D ROD-WELD IN PLACE - FILE ENDS TO TAPER
2 HOLES 1/4 DR SPACED BY 3/8 DR
25°

Details of the golf bag cart and the bill of materials



Assembly drawing of the golf bag cart



Two views of the golf bag cart

cuts smooth. (*g*) Locate and drill cotter key holes in axles. (*h*) Saw outside ends of axles to final length. (*i*) Locate leg lock holes in leg plate by scribing lines along edge of leg pieces with legs in both "up" and "down" positions. The same pin holds legs in "open" and "folded" positions. (*j*) Drill lock holes. (*k*) Arc weld lock bracket to leg plate with pin in locked position. (Spring must be kept cool.) (*l*) Fasten wheels in place with cotter keys.

This completes leg and wheel assembly. Entire assembly will be arc welded to post bracket.

Post and Handle Assembly

I. Bag holders: (*a*) Saw bars to length. (*b*) Cut and bend strap loops. (*c*) Bronze weld loops in place. (*d*) Form bag holders —bend cold to fit a full size pattern. (Pattern indicated on plan may be altered to accommodate larger or smaller bag.)

II. Base plate: (*a*) Saw base plate bottom to length. (*b*) Cut and bend base plate top as shown on plan. (*c*) Arc weld two parts to each other.

III. Handle and post lock plates: (*a*) Lay out and cut lock plates to shape. (*b*) Locate and drill center bolt holes in each plate. (*c*) Locate and drill lock pin hole in handle lock plate.

IV. Handle: (*a*) Saw pipe to length. (*b*) Saw and file slot to receive lock plate.

V. Post body: (*a*) Saw pipe to length. (*b*) Saw and file slot to receive lock plate.

VI. Post bracket: (*a*) Heat and bend bracket as indicated on plan. (*b*) Saw and fit saddle ends to post.

VII. Assembly (post): (*a*) Weld lock plate to post. (*b*) Weld bracket in position. (*c*) Weld base plate to bottom end of post. (*d*) Weld bag holders to post. (*e*) Clamp leg-wheel assembly to post bracket and weld in position. (Line up very carefully before welding or difficulty will be encountered when folding wheels.)

VIII. Assembly (handle): (*a*) Weld lock plate to handle. (b) Saw handle lock pin to length and weld in position. (*c*) Weld handle bolt in position. (*d*) Hold handle in "up" and "down" positions on post and mark pin hole locations on post lock plate. (*e*) Drill pin holes in post lock plate. (*f*) Fasten handle to post with wing nut and washer.

Paint: Clean welding scale and flux residue from welded joints with a steel brush. Clean grease from metal with paint thinner or turpentine. Apply a coat of metal primer and a coat of a good grade aluminum enamel to all exposed surfaces. Legs may be placed in half folded position so inside surfaces of legs can be painted. After paint has dried, install skate straps on bag holders and handle bar grip on handle. The cart is then ready for use.

A RECORD PLAYER FOR THE GENERAL SHOP

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The project described herewith co-ordinates several activities and fields of interest in a general shop program. It involves

at least three different areas, namely, wood, sheet metal, and electricity.

Directions for Building a Phono Record Player

I. *Fabrication of Wood Cabinet* — Figures 1 and 2

1. Get the desired kind of wood and plane it down to $^{15}/_{16}$-in. thickness.

2. Cut three pieces 9 in. wide and 14 in. long.

3. Select the best piece for top section and make layout as shown.

4. With a large forstner wood auger counterbore the back portion down to leave $^{3}/_{8}$-in. thickness inside the layout lines.

5. Cut out openings for motor and speaker.

6. Drill holes for volume control and pickup arm.

7. Make a layout on the remaining two lower sections to correspond with the counterbored portion of the top section.

8. Drill $^{3}/_{8}$-in. hole along cutout line of two lower sections, then saw out center portion on jig saw.

9. Glue three sections together.

10. Clamp sections together firmly all around. Let dry overnight.

11. With a large band saw saw the ends to curved specifications. Leave small amount for sanding.

12. Sand down roughly on belt sander to line shown on layout. Drill ¼-inch hole on curved end for cord; No. 40 holes for rubber feet.

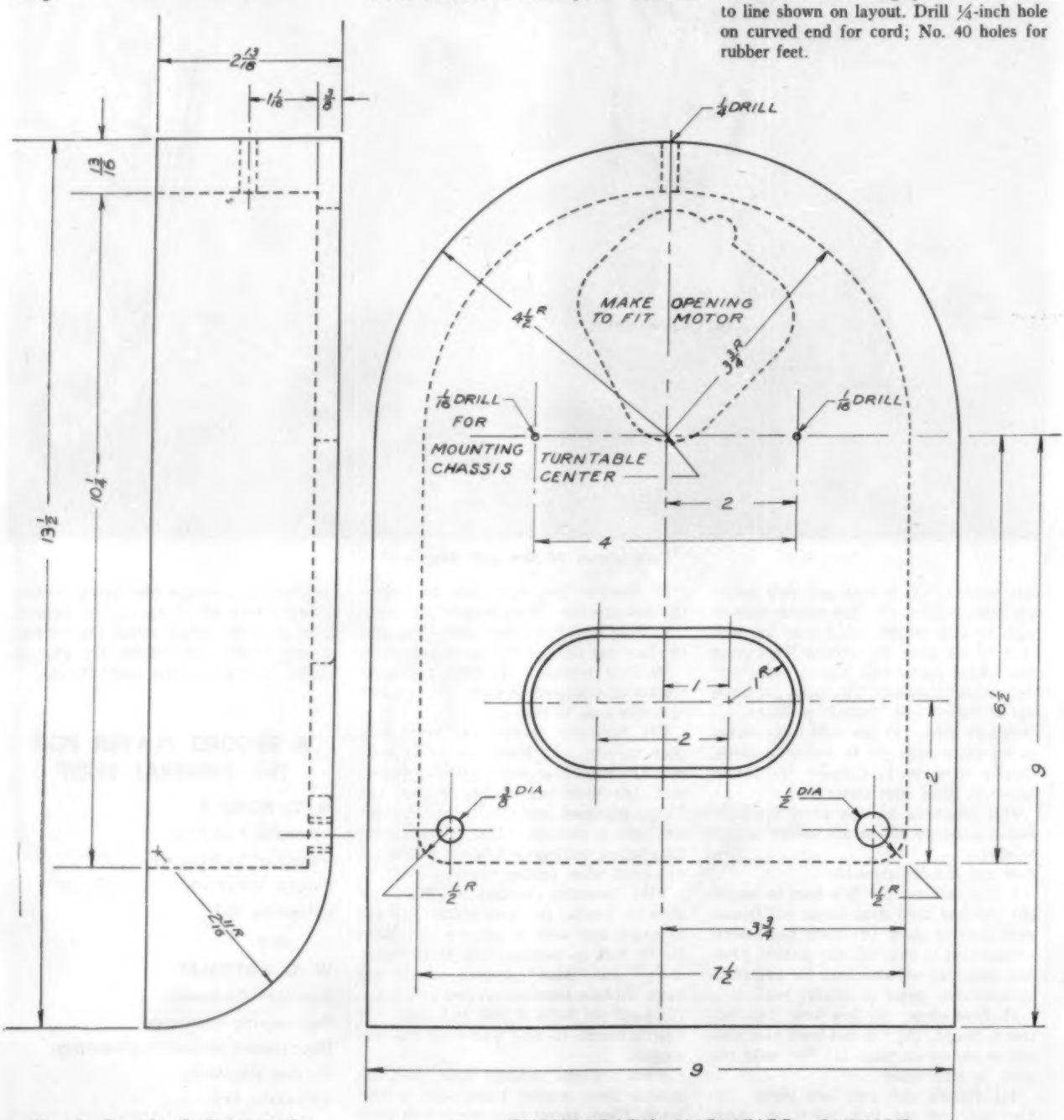

Fig. 1. Details of phonograph amplifier cabinet

PHONOGRAPH AMPLIFIER CABINET
TOP VIEW - LAYOUT
SCALE 1"=1"

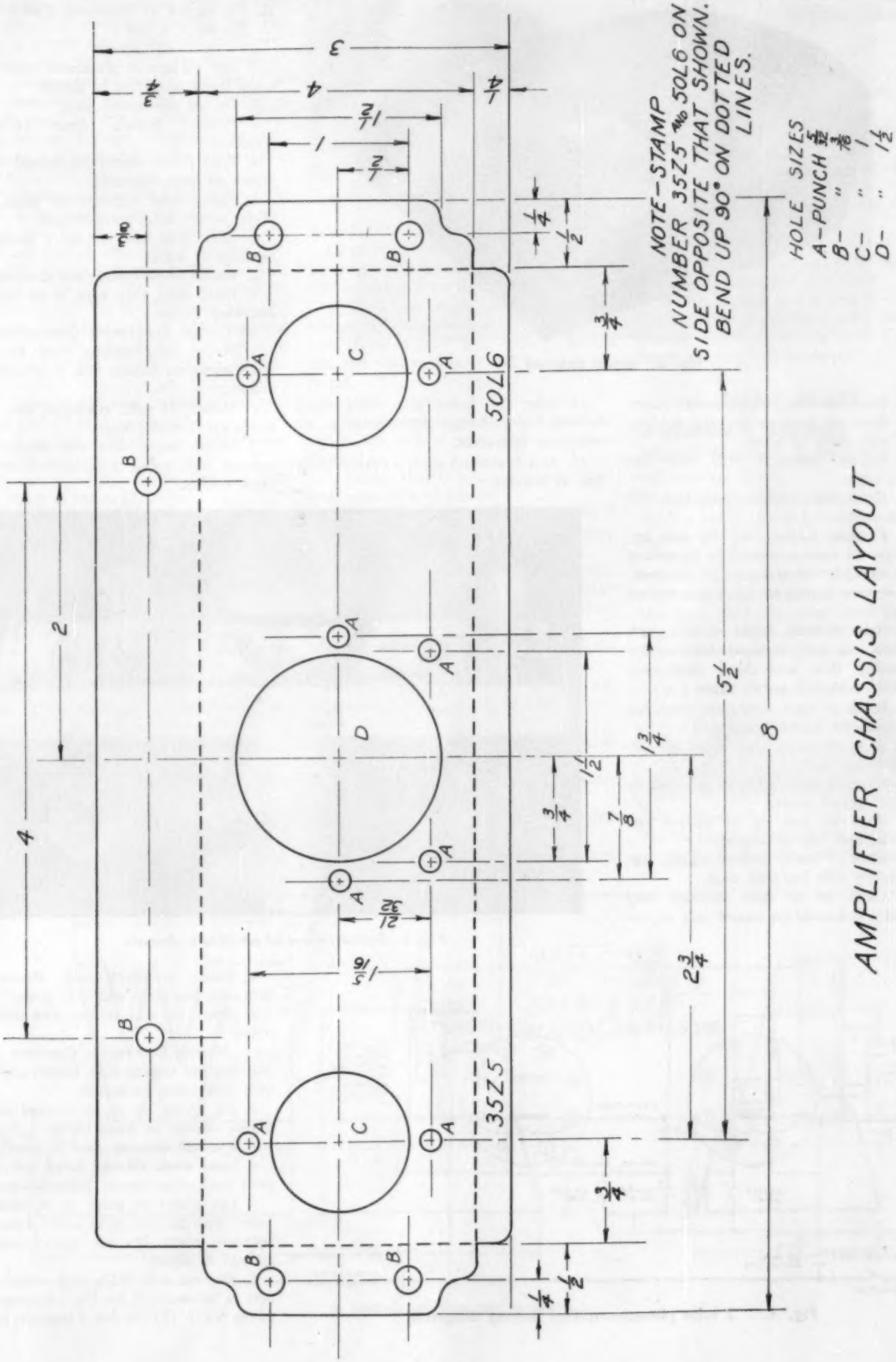

Fig. 3. Detail of chassis layout

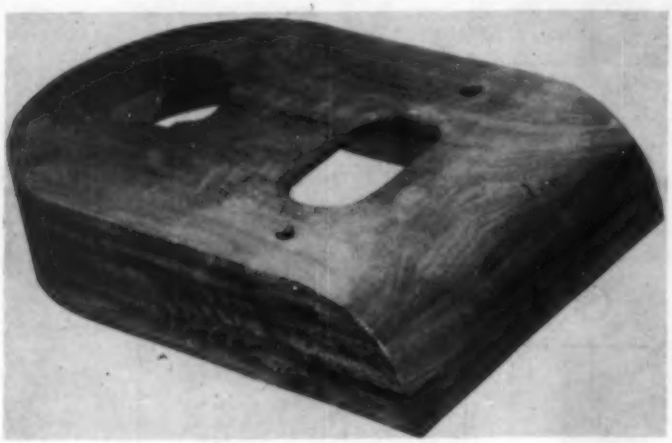

Fig. 2. Wood cabinet

13. Using medium garnet abrasive paper, work down all surfaces by hand sanding. Sand with grain of wood.

14. Repeat operation (13) with fine garnet paper.

15. Give final sanding with fine 5/0 garnet paper.

16. Examine surface carefully with finger tips. All surfaces should be smooth as glass, especially the end grain of the wood. This is very important for a fine rubbed finish.

17. Now moisten entire surface with water to raise grain of wood. Allow to dry thoroughly, then sand down again very smoothly with 5/0 garnet paper.

18. Brush on clear wood filler which has been toned for kind of wood used.

19. Wipe off across grain after the surface becomes dull.

20. After 24 hours go over again lightly with 5/0 garnet paper.

21. Wipe all dust off of surface and spray on first coat of lacquer.

22. After 24 hours go over outside surface lightly with fine steel wool.

23. Clean off all dust particles very carefully and spray on second coat of lacquer.

24. After 24 hours start final hand rubbing for mirrorlike luster finish as directed by instructor.

25. As a final finish apply a coat of paste wax as directed.

II. *Fabrication of Electronic Unit* — Figures 3, 4, and 5

CHASSIS

1. Get a piece of aluminum stock and make layout according to sketch.

2. Do not use layout dope.

3. Protect surface from excessive scratches.

4. Prick punch, center punch, and bench punch all holes indicated.

5. Stamp tube numbers on edges opposite socket holes as indicated.

6. Saw, shear, and file away unwanted portions of metal.

7. Round off all corners and sharp edges.

8. Bend sides, then ends to 90 deg. as indicated. Polish.

MOUNTING ELECTRONIC COMPONENTS

1. Mount tube sockets with keys in same direction. Mount with 6–32 machine screws.

2. Mount .25 mfd. condenser also with 6–32s and terminal strips.

3. Mount heavy duty wire wound line resistor with metal strip, and 6–32 machine screws.

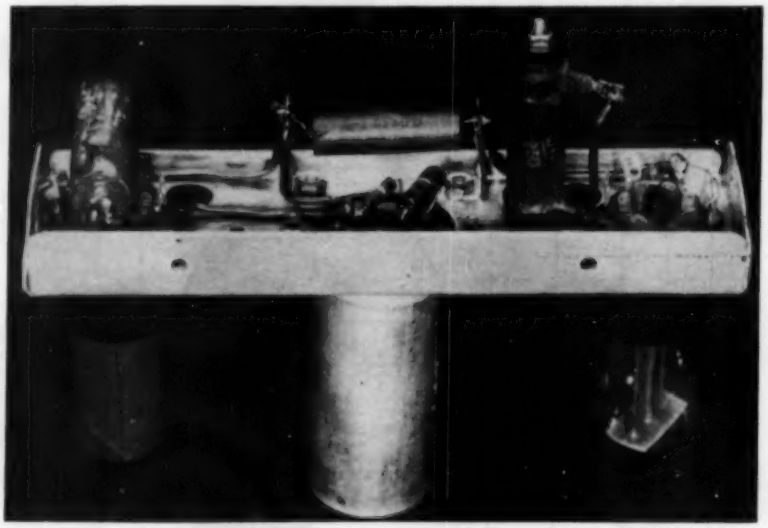

Fig. 5. Bottom view of electronic chassis

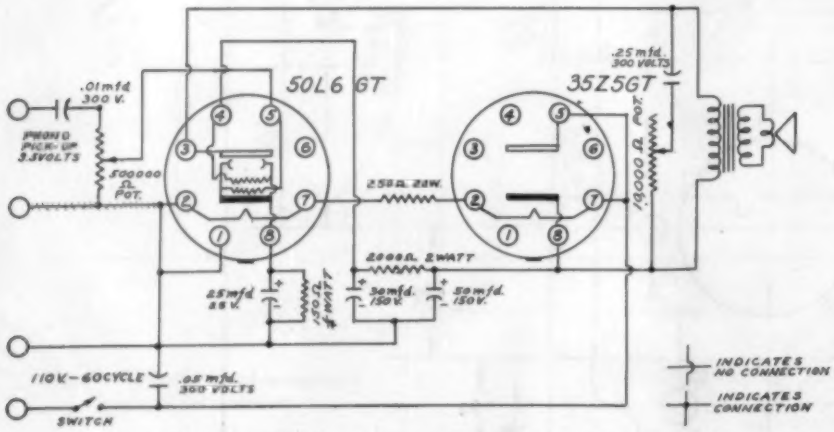

Fig. 4. 2 tube phono-amplifier wiring diagram

4. Mount 50–30–25 mfd. electrolytic with mounting strip, and 6–32 screw.

5. Mount .05 mfd. tubular with terminal strips.

WIRING ELECTRONIC CIRCUITS

1. Procure hookup wire, solder, and iron with rack from stockroom.

2. Do wiring on paper covered tables. Mount chassis on wood blocks.

3. Keep all wires as short as possible.

4. Loop wires through holes and make good mechanical contact before soldering.

5. Lay solder on point to be soldered. Touch with hot iron until solder flows well between joints. Do not apply excessive amount of solder.

6. Starting with 50L6 tube socket connect as follows: (*a*) Pin No. 1 is connected to pin No. 2. (*b*) Pin No. 2 connects to the

following: (1) The foil side of the .05 mfd. the 50–30–25 electrolytic tubular. (*c*) Pin No. 3 to one side of the .25 mfd. condenser. (*d*) Pin No. 4 to the 30 mfd. of the tubular electrolytic. (*e*) Pin No. 5 is left open for the time being. (*f*) Pin No. 6 is left open. (*g*) Pin No. 7 is connected to one side of the wire wound resistor. (*h*) Pin No. 8 is connected to the positive side of the 25 mfd. lytic.

7. Turning next to the 35Z5 socket connect it as follows: (*a*) Pin No. 1 is left open. (*b*) Pin No. 2 is connected to remaining end of wire wound resistor. (*c*) Pin No. 3 is left open. (*d*) Pin No. 4 is left open. (*e*) Pin No. 5 is connected to pin No. 7. (*f*) Pin No. 6 is left open. (*g*) Pin No. 7 is connected to the remaining end of the .05 tubular. (*h*) Pin No. 8 is connected to the 50 mfd. of the electrolytic.

8. Connect 150 ohm resistor across terminals of 25 mfd. condenser.

9. A resistor code chart is available for computing resistor values.

10. Connect 1000 ohm resistor direct to pin No. 8 of the 35Z5.

11. The remaining end of the 1000 ohm resistor to pin No. 4 of the 50L6.

12. Obtain an 8-in. piece of shielded volume control cable from instructor.

13. Solder center wire to pin No. 5 on the 50L6.

14. Solder outside shield to pin No. 2 on 50L6.

15. Solder center tap of volume control to other end of center cable.

16. Solder shield to volume control so turning to right is gain.

17. Solder red transformer lead to pin No. 8 of the 35Z5.

18. Solder blue transformer lead to pin No. 3 of the 50L6.

19. Obtain two 9-in. leads of wire. Connect to tone control.

20. Connect one remaining end to pin No. 8 of the 35Z5.

21. Connect the other to the remaining terminal of the .25 mfd. condenser.

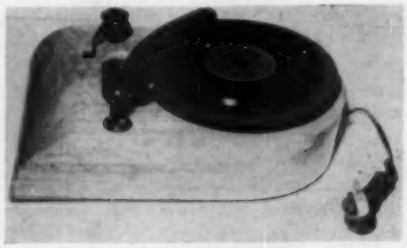

Fig. 6. Completed unit

III. *Mounting Parts in Cabinet* — Figure 6

1. Check out large soft cloth to lay cabinet on while working.

2. Mount rubber feet, pickup, pickup rest and volume control and knobs as directed.

3. Mount motor.

4. Lay cabinet on cloth with bottom up and mount speaker grille with speaker as directed.

5. Mount chassis and screw into place with tubes toward speaker.

6. Attach one 110 volt wire to pin No. 7 on 35Z5, and the other to the remaining terminal of the switch.

7. Shorten pickup wires and attach black lead to .01 capacitor and the other lead to the remaining Volume Control lead.

8. Attach the other end of the .01 to the shielded cable on the Volume Control.

9. Check all wires to see if they are snug against wood cabinet and away from tubes.

10. Turn right side up, place turn table on spindle and operate.

IV. *Parts List of Electrical Components (approximate cost — $15)*

Phono motor and turntable of desired speed
Crystal pickup arm of 3 to 4 volts output
4 in. PM speaker with 4-ohm voice coil
Output transformer to match 50L6GT to 4-ohm speaker
110 volt line cord, 6 ft.
2 octal sockets
500,000 ohm volume control with switch (dual unit with below)
10,000 ohm volume control for tone (dual unit with above)
.25 mfd. 300 volt fixed capacitor for tone
.05 mfd. 300 volt fixed capacitor
50–30–25 mfd. 150–150–25 volts electrolytic filter capacitor
.01 mfd. 300 volt fixed capacitor
250 ohm, 20 watt line dropping resistor
150 ohm, ½ watt carbon resistor
1000 ohm, 2 watt carbon resistor
Control knobs to fit dual control above
Rubber mounting feet
Incidental mounting hardware

NAME PLATE

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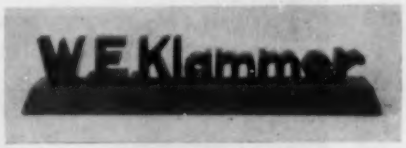
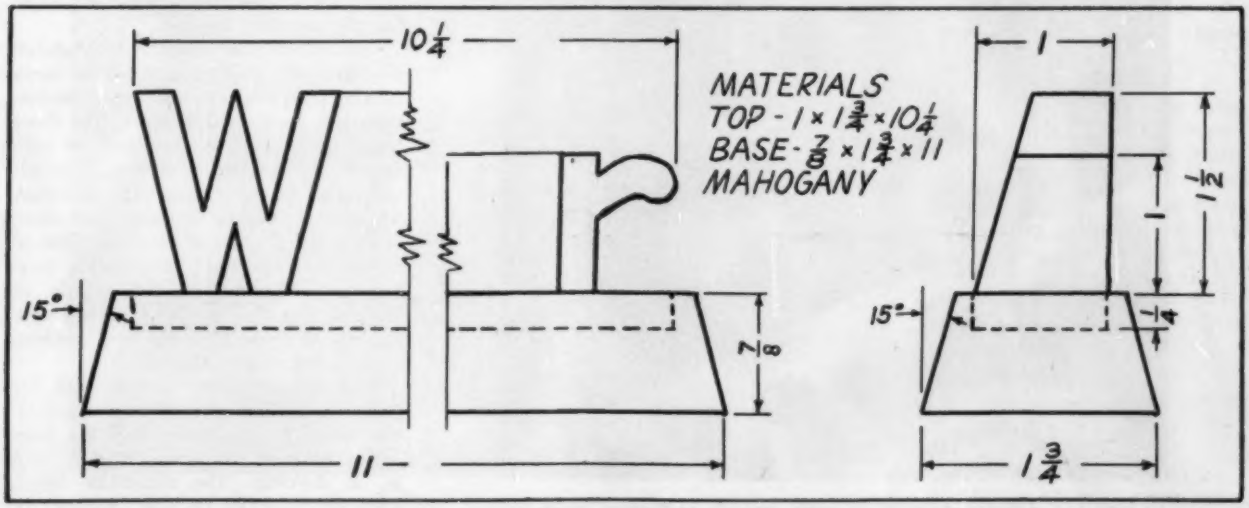
Kalamazoo, Mich.

A name plate of wood makes a gift which is really personal. Such a project is popular with the students. Variety in choice of wood, type of base, and design of the letters used makes each one different. The project shown in the picture is of Honduras Mahogany with the name inset into the base. Others have varied this by using a larger base to include also a pen and pencil desk set.

On a block of wood about 1 by 1¾ by



Name plate of Honduras Mahogany with name inset into the base



Details of the name plate

10¼ in., lay out the letters on the 1¾ by 10¼-in. surface, leaving a ¼-in. strip across the bottom. Naturally, the length of the block must vary with the name. After cutting out the letters with a jig saw, cut the front face of the letters only at a 15-deg. angle on a circular saw. Then it is a matter of filing, sanding, mounting in or on some type of base, and finishing the project.

COPPER ENAMELING BY AIR-ACETYLENE TORCH

PETER T. McKINNEY
Chicago, Ill.

(Part I)

Copper enameling is a simple art that can be quickly learned and put in practice by elementary students. On the other hand, the art can be quite advanced and, therefore, suitable for pupils at high school level as well as adults attending craft and hobby courses.

Until recently most copper enameling was done with an electric kiln, but many arts and crafts instructors have found that using an air-acetylene torch has many advantages over the kiln. Among these advantages are: fast firing, no warm-up time as with a kiln, visible firing, easier control of heat and ability to swirl without loss of heat. Another favorable factor is that oxyacetylene blowpipes and air-acetylene torches are already found in many schools, thus saving the expense of new equipment. Many schools have worked out arrangements where arts and crafts instructors share equipment originally purchased for vocational shops. In this way, the school is spared the expense of additional equipment or kilns. In Figure 1 is shown a variety of articles enameled with the air-acetylene torch, which in Figure 2 is shown heating a copper jewelry part.

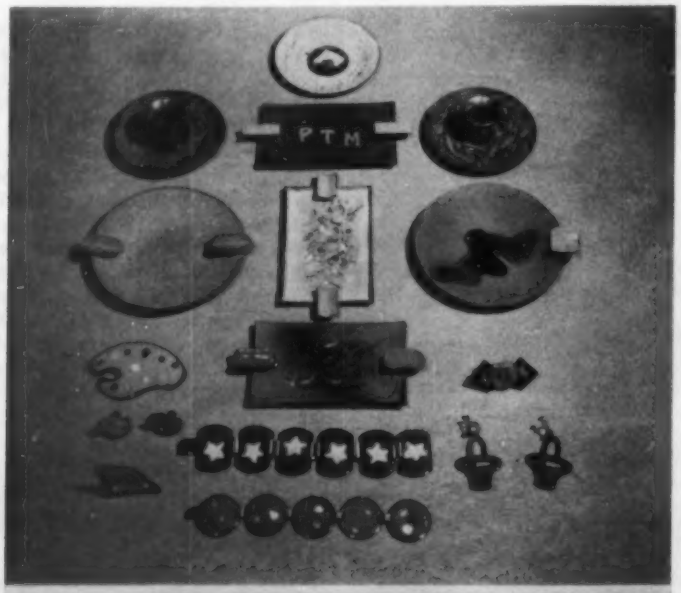


Fig. 1. Articles enameled with an air-acetylene torch.
Fig. 2 (lower). Heating a copper jewelry part

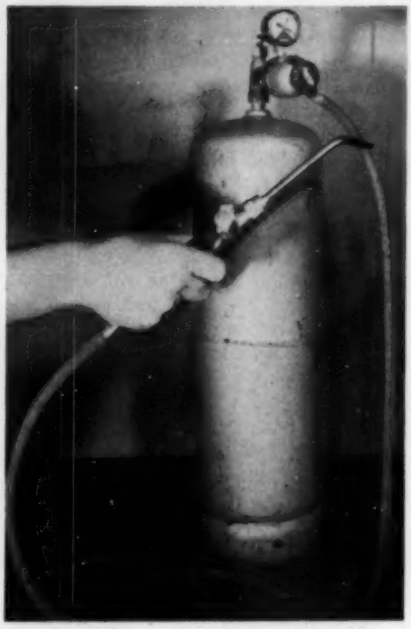


Fig. 3. A simple air-acetylene setup

Some readers will recognize the equipment shown in Figure 3. This simple air-acetylene setup is all that is needed for your heat source in copper enameling. The acetylene cylinder shown is a *B* size "Prest-O-Lite" acetylene tank sold by welding distributors, wholesale auto supply houses, wholesale hardware dealers, and others. Depending on location, the *B* tank sells for about $22, including the 40 cu. ft. content of acetylene gas. When the tank is empty, it is exchanged at the dealer for a filled tank that costs $3.50 for the acetylene content.

The air-acetylene torch is also shown in Figure 4. This is a standard torch used by plumbers, air conditioning servicemen, and sheet-metal workers. The flame temperature given by this torch is 3800 deg. F. For copper enameling, it is advantageous to use a flame with this high temperature. Copper disperses heat quite rapidly, and if you use lower temperature flames, heating times are unduly long. For example, a copper disk 1½ in. in diameter is heated to the enameling temperature of about 1450 deg. in 20 seconds using a No. 3 size tip.

The various styles of tips used for copper enameling are shown in Figure 5. The large No. 6 tip is used for large pieces, such as ash trays, from 3 to 6 in. in diameter. The multiflame tip is ideal for parts up to 2 in. diameter or 2 in. square. This tip gives ample heat

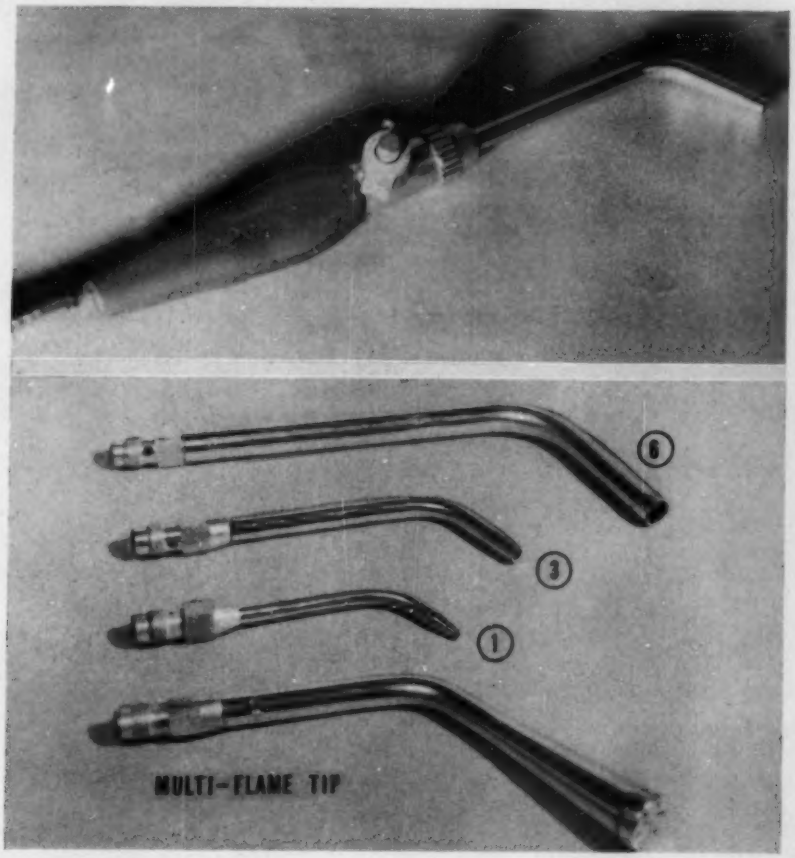


Fig. 4. Torch with built-in pilot flame. Fig. 5 (lower). Tips used for enameling

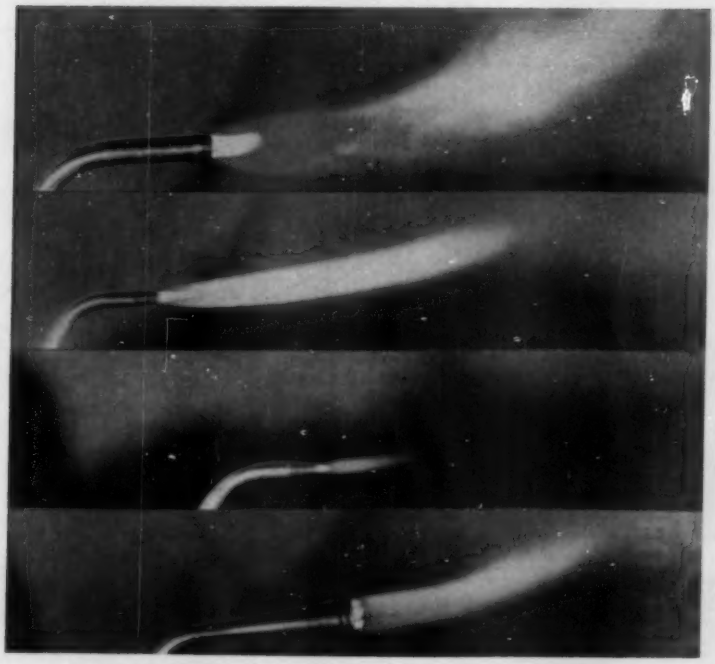


Fig. 6. Relative size of flame volume of the various sizes of tips

in a fairly broad area. The heating ability of the No. 3 tip is a little higher than the multiflame tip, but with the No. 3 tip you are able to maintain the heat on a smaller area of the part being enameled, if you wish to do so. Also, the No. 3 tip is useful for soldering together larger pieces.

To solder jewelry findings on the back of pieces, the No. 1 tip is the proper size to use. The tiny flame can be directed to just the area you wish to heat, and, with a little practice, a student can do a professional job.

The relative sizes of the flames produced by the four tips will be seen in Figure 6. Flame sizes of tips Nos. 1, 3, and 6 can be decreased by cutting down the flow with the needle valve or by decreasing the pressure of the acetylene. In the case of the multiflame tip, it should always be remembered that it operates with 5 to 8 lb. of acetylene pressure.

Because of the widespread use of oxy-acetylene welding in high schools, it is valuable to know that the acetylene from larger cylinders can be employed in the air-acetylene blowpipe without disturbing the usual connections to the oxyacetylene welding and cutting apparatus. Figure 7 shows a "Y" connection on a standard acetylene regulator. The cylinder shown is a WQ size, but the same hookup can be used on larger acetylene cylinders which may be in your school. You will notice in the illustration that a needle valve is used between the "Y" connection and the hose to the air-acetylene blowpipe. When the cylinders are being used for oxyacetylene welding work, this needle valve is closed. When the acetylene cylinder is being used for copper enameling, the needle valve is open. This means that the acetylene pressure is in the hose leading to the oxyacetylene blowpipe. Be sure that the acetylene valve on the latter is closed if you hook up your setup as shown. If you wish, you can connect the air-acetylene hose directly to the acetylene regulator, and thus eliminate the "Y" connection.

As with other combustible gases, the use of acetylene requires caution. If your school already uses acetylene in the welding shop and you plan either to use this supply or decide to obtain new acetylene cylinders for enameling, consult with the teacher or supervisor in charge of welding. If you are introducing acetylene into the school for the first time, you should obtain and read the booklet "Precautions and Safe Practices" published by the International Acetylene Association, 205 East 42nd Street, New York, N. Y. This booklet explains in detail the safety rules you should follow in using acetylene.

You should frequently test hoses, connections, and torches for leaks. To test for leaks at connections, apply soapy water

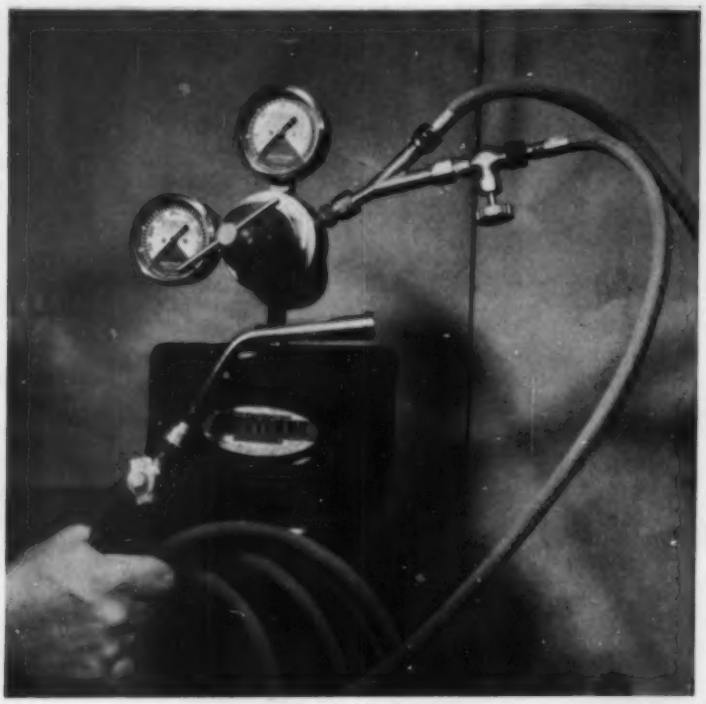


Fig. 7.The Y connection on a standard acetylene regulator

with a small paint brush. Leaks will form bubbles. Leaks in hose can be found by immersing the hose in water while the hose is under the pressure of acetylene normally used.

Do not test for leaks by use of a flame. Acetylene has a characteristic odor which is not unpleasant and which is readily recognized. Get acquainted with this odor.

Be sure to impart to students who handle a torch the safety fundamentals. Teach them the same respect for a flame that is 3800 deg. F. as they have for a crosscut saw spinning 2500 r.p.m.

(NOTE: This first part of a two-part article on enameling copper by means of an air-acetylene torch gives details on required apparatus and the safety precautions. Part II will show how the torch is used as a tool to enamel the copper and solder on fittings.)

A BENCH HOOK

FILMORE GLUCK
Roosevelt Jr. High School
Roosevelt, L. I., N. Y.

This bench hook was chosen as a basic review project for our 7–8 and 9th grade woodworking classes. These students entered our new school this fall after coming from several primary schools with varying degrees of skill and knowledge of hand tools.

The review gave everyone an equal start in using the following hand tools:

1. Jack plane
2. Marking gauge
3. Try Square
4. One foot rule
5. Crosscut saw
6. Hand drill and bit
7. Auger brace and countersink
8. Screw driver
9. Center punch
10. Sanding block, etc.

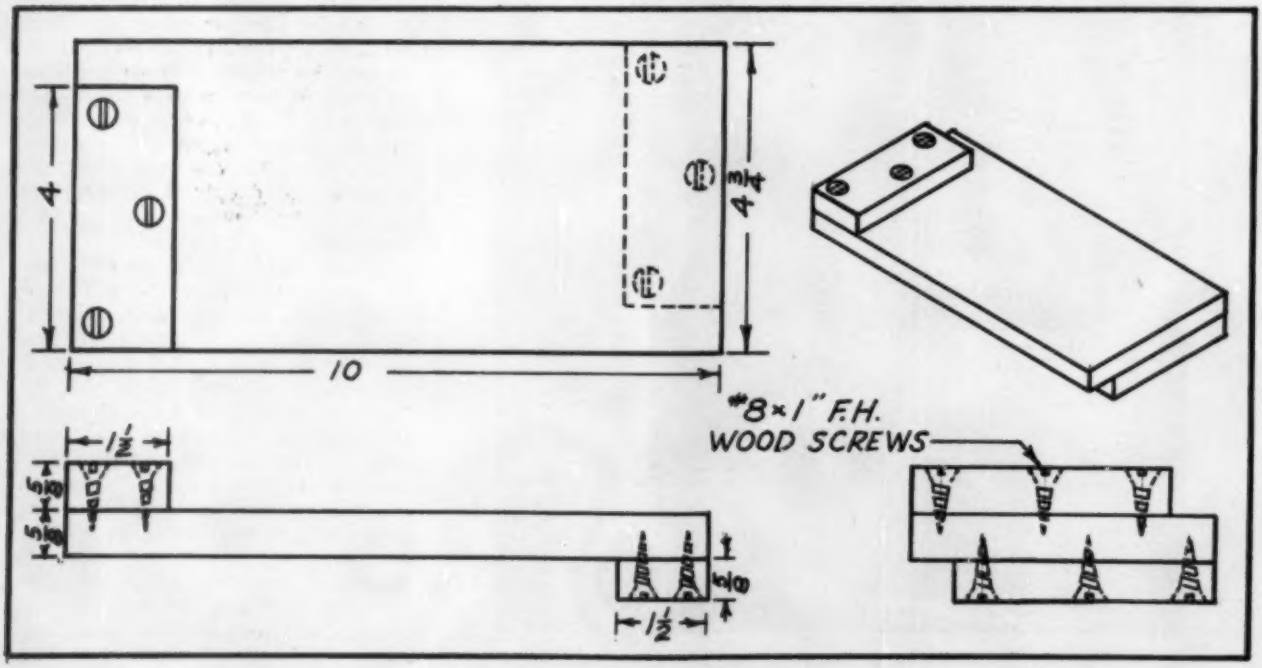
Appropriate tool demonstrations were given as the project progressed.

It provided each boy with his own bench hook which can be kept in his own locker for further use.

It saves wear and tear on the miter box and also waiting in line to use it.

It is handy for small crosscutting jobs.

It is helpful to use for a cutting board



Details of a bench hook

where paring with a chisel is necessary.

The students were given an orthographic and isometric drawing of the bench block so that the work we had in related information classes would begin to fit into their actual shopwork.

They were supplied originally with one piece of clear white pine, approximately 6 by 15 in. From this one piece of wood they were able to make the entire project.

POCKET SAVER

ARTHUR O. BERRY
King Junior High School
Portland, Me.

The junior high student likes to make a project he can use. When he is making a project of this type, he has more interest and tries harder than he would on a project in which he has little interest.

The pocket saver is such a project, because they can use it as soon as it is completed or it can be used as a gift for dad.

The one shown was made of 3 oz. embossed leather, laced with the whip stitch, and a filler made of celluloid to hold the pencils.

The procedure for making the pocket saver is as follows:

1. Select leather for parts A, B, and C.
2. Make patterns of parts.
3. Cut parts to shape with scissors.
4. Cement parts A and B together around edges with rubber cement.
5. Cement part C to part A.
6. Punch holes for lacing with thonging chisel.
7. Lace edge with whip stitch.
8. Cut celluloid to correct size and fold to shape.
9. Slide celluloid filler into slit on assembled parts.

Correction

The additional items shown herewith were unfortunately omitted in our equipment list for the metalworking shop in the March, 1957, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION.

BENDER — For bending bar, flat metals, and tubing.
Accessories for benders
Stand for bender

BRAKES — Box and pan
Stand for brake

NOTCHER — Capacity, 16 mild steel; 90 degree notch (maximum 6 by 6 in.)
Stand for notcher

ROLLERS — 16", 18", 24", 30", and 36-in. forming width; for 16", 18", 20", and 22-gauge mild steel capacity respectively
Stand for rollers

SHEARS — Capacity, 16-guage mild steel; shearing width 6, 9, 12, and 24 in.
Stand for shears

The following should be remembered when making an equipment list for the arts and craft room or the general shop where plastics are used.

PRESS — For stretch forming, free blowing, blow molding, and vacuum forming thermoplastic sheet materials.

MEALTIME ACCESSORY

JOS. J. LUKOWITZ
Milwaukee, Wis.

Here is a project that will literally, as well as figuratively, "ring the bell."

This project can be used in every home.

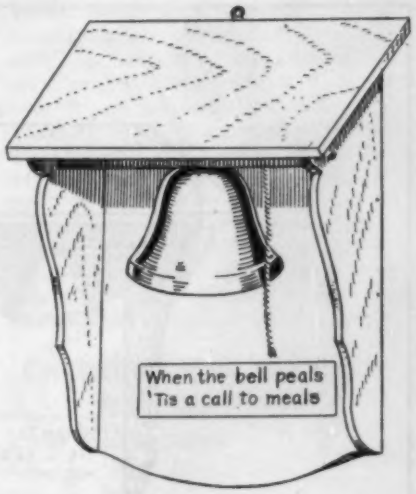
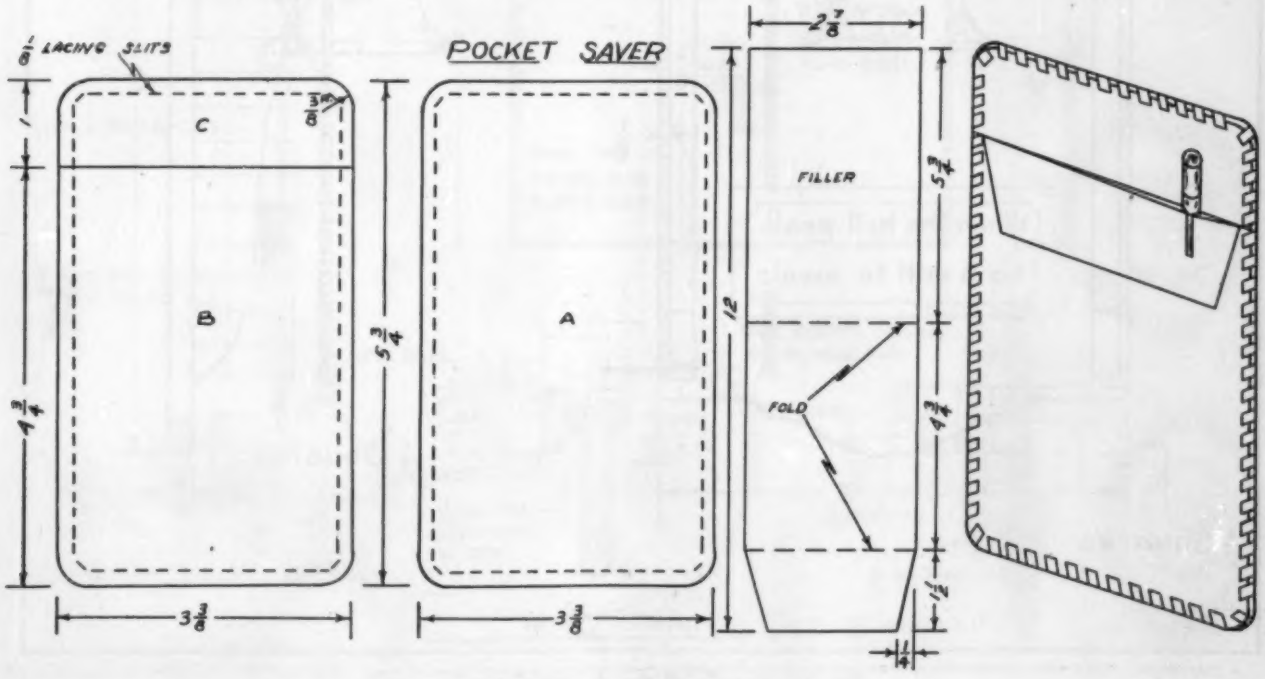


Fig. 2. The finished bell

Mother will appreciate it. It will make the daily call to meals easier. The project captivates the interest of the boys and provides motivation which encourages accuracy and care in the construction. Knotty pine is an appropriate wood to use for this but almost any available wood may be used. One-quarter inch material could be used but experience has proved that boys experience difficulty in nailing this thickness; so, ⅜-in. thickness is recommended. The ⅛-in. offset at the back adds to the effect, but if lack of ability precludes this construction, use the much simpler method shown in Figure 2. If the sides are nailed to the edges as shown in



Details of the pocket saver

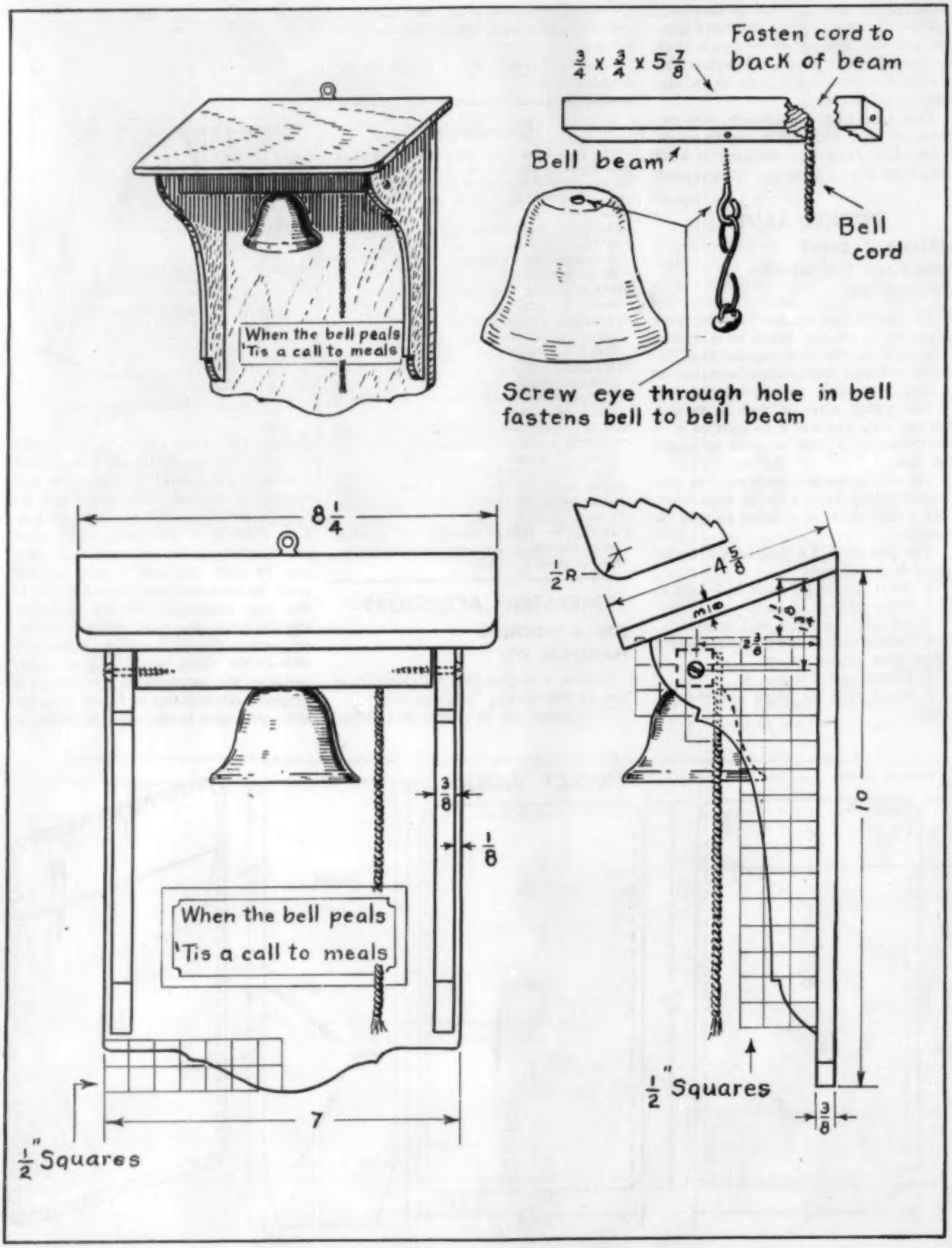


Fig. 1. Details of the mealtime accessory

Figure 2 the back should be 6 in. wide and the ends 3¾ in. wide at their widest part.

There are many variations in design possible in this project. Figure 2 differs from Figure 1 in this respect.

Use tan or buff paper for the lettering. White paper would not look well with any finish. A brown shoe lace with the tip removed could be used for the bell cord.

This project is of the type that tends to build good public relations. Encourage your classes to make it for their own and their relatives' homes. Use the project for birthday gifts, Christmas gifts, etc.

MUSIC STAND

HERBERT W. YANKEE
High School
Stratford, Conn.

The music stand described herewith is a popular school project. Teachers looking for projects which can be made using factory production methods will find this music stand especially advantageous. It has been used very effectively in a general metals shop since it offers the pupil experiences in foundry (the base), machining (the upright support), and sheet metal (the music supporting tray). It is a relatively simple project exposing the pupil to such operations as layout, cutting, drilling, threading (external and internal), piercing, basic lathe turning and knurling, riveting, casting, and assembly procedures.

The base is cast from a simple pattern made from soft pine or mahogany. If desired, the relief on the underneath side of the base may be turned out rather than being cast. The base should be made of aluminum which can be cast very conveniently in most school foundries. The music stand is designed so as to be completely adjustable. Therefore, the upright or post is made in two pieces, one fitting into another. The lower section is made from commercial ⅜ I.D. galvanized pipe with a 5/16 — 11 NC thread cut on each end. The upper section is a piece of cold rolled steel with a 7/10 — 14 NC thread cut on one end. The coupling which allows for adjustment is made from 1¼-in. dia. machine steel cut to ¾ in. in length. A ¼ — 20 NC thread is tapped in the coupling and a 9/32-in. dia. hole is drilled in the lower pipe. A thumb screw which has been turned on a lathe (or a commercially purchased thumb screw is used in its place) is screwed into the ¼ — 20 hole.

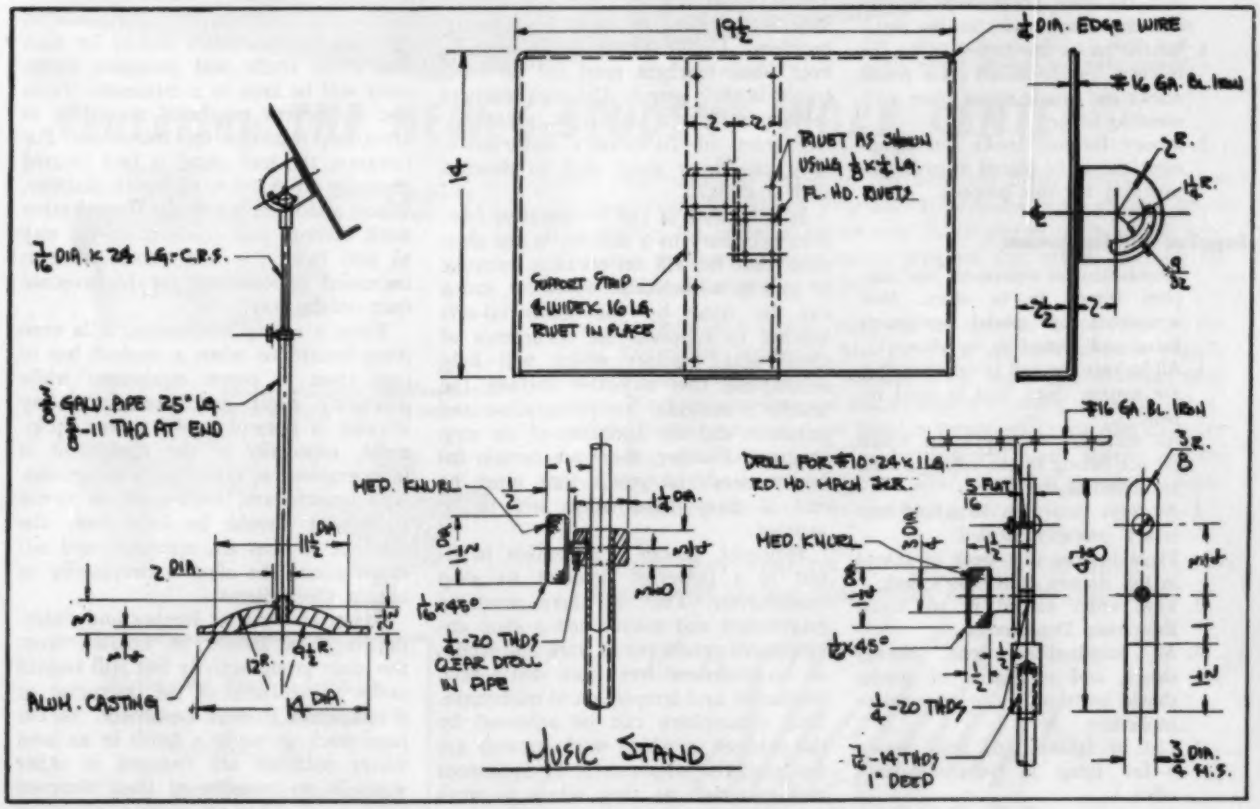
The upper bracket connection allows the tray to tilt. It consists of a ¾ diameter piece of machine steel part of which has been milled off flat. This mates with the No. 16 ga. black iron bracket as shown. Another thumb screw is required for this assembly and a commercially purchased screw can be used in the place of the one illustrated. The top tray is also made from No. 16 ga. black iron, edge wired for rigidity and bent to a right angle along one edge for book support. The top is fastened permanently to the bracket by means of flat head rivets.

Excellent results have been obtained by painting the stands with a commercial preparation known as *crackle finish* paint, using black, green, or maroon. All sharp corners should be removed before painting.

CHECKING OUT BULLETIN FOR TEACHERS

JOHN F. DONOVAN
Principal, High School
Concord, Mass.

The purpose of this bulletin is to assist teachers in remembering the many details that have to be attended to at the close of school. Perhaps if each teacher checks each item as the work is completed it will aid both the teacher and the principal to see that all matters pertaining to the closing of school have been attended to. Teachers are asked to turn this check list in to the principal or supervisor before leaving for the summer. This will be of great assistance to him.


19½
¼ DIA. EDGE WIRE
#16 GA. BL. IRON
RIVET AS SHOWN USING ⅛ × ½ LG. FL. HD. RIVETS
SUPPORT STRIP 4 WIDE × 16 LG. RIVET IN PLACE
7/16 DIA. × 24 LG. - C.R.S.
⅜ GALV. PIPE 25" LG. ⅜ - 11 THD AT END
2 DIA.
ALUM. CASTING
MED. KNURL
1½ DIA.
⅛ × 45°
¼ - 20 THDS CLEAR DRILL IN PIPE
DRILL FOR #10 - 24 × 1 LG. FD. HD. MACH SCR.
5 FLAT
⅜ DIA.
¼ - 20 THDS
7/16 - 14 THDS 1" DEEP
¾ DIA. M.S.
MUSIC STAND

Details of the music stand

Teacher.....

Rooms

... 1. All blackboards cleaned.
... 2. All display material removed from bulletin boards.
... 3. All pupils' desks cleared of all papers, books, etc., and left in as clean condition as possible.
... 4. Teacher's desk and worktable cleared on top.
... 5. Storage closets and bookcases neatly and systematically arranged.
... 6. List of needed repairs to room or furniture submitted to the office (this would include need of new shades, paint on walls, furniture in need of repair, indications of leaks, etc.)
... 7. American flag properly stored in closet.

Books

... 1. All books collected from students should be properly stored and counted. Textbook inventory cards brought up to date.
... 2. All books which need rebinding should be tied in a bundle, labeled with title, author, publisher, and the number of copies. Place them in the office.
... 3. Requisitions for new textbooks, replacements, or additions for the opening of school should be turned in to the office. (*Don't depend upon ordering extra copies in the fall.*)
... 4. Before books are turned in to the teachers, pupils should erase pencil marks and repair minor tears with mending tissue.
... 5. Money for lost books and equipment should be placed in envelopes provided for this purpose.

Supplies and Equipment

... Requisition for equipment and supplies turned in to office. New equipment or special equipment listed and turned in to office.
... 1. All lockers checked to see that they are empty, clean, and in good repair.
... 2. All materials of any value which do not belong to the school should be placed in the office.
... 3. All keys turned in to school secretary properly labeled.
... 4. Plans for the first week of school in top drawer of teacher's desk.
... 5. Film order turned in to Visual Education Department.
... 6. All standardized tests, answer sheets, and summaries of results should be turned in to principal or supervisor.
... 7. List of failures and brief reason — for filing in superintendent's office.
... 8. All marks and pupils' records complete.
... 9. Inventory of all furniture, supplementary books (those not on inventory cards), supplies, etc.
...10. All cutting tools ground, sharpened, and oiled for storage.
...11. All machines thoroughly cleaned.
...12. Bright metal on all machines and tools oiled or greased and belts loosened.
...13. Empty and clean all waste buckets.
...14. All electric cells properly charged and stored.
...15. All dry batteries removed from special equipment.
...16. All electrical equipment disconnected.
...17. All test and demonstration equipment properly stored.
...18. Doors and windows secured.

ORGANIZATION — THE KEY TO GOOD STUDENT DISCIPLINE

FRED A. OLSEN

Washington Junior High School

Seattle, Wash.

Because students generally like shopwork, discipline in the industrial-arts shop need not be the problem that it often is. But like Ponce de Leon searching for the elusive Fountain of Youth, shop teachers often search in vain for a class free from disciplinary problems. Unlike Ponce de Leon, however, shop teachers need not be frustrated in their search. Although teachers seldom instruct a class that is entirely free from all disciplinary disturbance, they can do a great deal to develop such a group.

It is because of the comparative freedom necessary to a student in the shop class that he will on occasion provoke or join in misbehavior. However, much can be done by the industrial-arts teacher to suppress the occurrence of these acts. Factors which will help accomplish this objective include the teacher's attitude, his preparation and patience, and the flexibility of his shop program. Further, there are certain inherent needs of youth that must be met if shop disturbances are to be avoided.

However, proper organization in itself is a powerful deterent to shop misbehavior. That is, there must be established and maintained a shop environment conducive to work and study, an environment free from distraction, confusion, and temptation to misbehave. This atmosphere can be achieved by the manner in which work stations are assigned, the arrangement of equipment and materials as they relate to work stations and supervision, and the organization of shop personnel.

Assignment of work stations often results in rebellion and discord among shop students. This undesirable conflict occurs when two or more students, who are antagonistic toward one another, are assigned adjacent work stations. Also, many students are products of social inferiority or rejection long before they enroll for their first industrial-arts course. These deep-seated feelings will definitely affect the social climate of the shop class. Such feelings, in turn, will affect the harmony of relations among students in that class.

In order to achieve maximum harmony, students can be assigned work stations where they will receive maximum social acceptance. Social acceptance should be encouraged only to the extent of developing harmonious working relations and not to the point where *gangs* are formed. Perpetual troublemakers should be separated and kept as near direct supervision as possible. If possible, the instructor should attempt to team isolates (those students without friends) with natural leaders.

After assigning work stations on this basis, it is a good idea for the instructor to watch for any discord between students working near each other and make changes if necessary.

The location of equipment, materials, and work stations is often another contributing factor toward student confusion and misbehavior. The location of tools and materials should be such that cross traffic and excessive movement will be kept to a minimum. Tools and equipment separated according to areas help minimize this movement. For instance, the tool panel is best located centrally in relation to bench stations. Where a student must pass several other work stations and students on his way to and from the tool panel, there is increased opportunity for his misconduct on the way.

From a safety standpoint, it is even more hazardous when a student has to pass close to power equipment while procuring tools and materials. Any shoving or horseplay near power equipment, especially if the equipment is in operation, is exceedingly dangerous. Attachments and tools used on power equipment should be kept near the machine so that the operator need not move about the shop unnecessarily to obtain those items.

Materials such as lumber and finishing supplies should be isolated from the main group activity but still remain under surveillance of the instructor or a competent student supervisor. To cut long stock or apply a finish in an area where students are engaged in other work is an invasion of their assigned work space. They are quick to recognize

(Continued on page 20A)

NOW! A TOTAL EXPERIENCE PROGRAM FOR YOUR SHOP—FROM *Sheldon*

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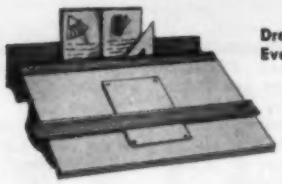

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New Combination Woodworking-Metalworking Vise for Every Student

Now your industrial arts shop can have the many advantages of a Sheldon Total Experience Program. It provides every student equal opportunity for learning experiences in all phases of industrial arts. This is a compact, comprehensive program that makes teaching far easier and more rewarding for you.

The new Sheldon 6-student work centers serve as the nucleus of the Total Experience Industrial Arts Program. At each of these centers you can teach woodworking, metalworking, mechanics, drawing, electricity. They are also designed and equipped for study, class discussion, demonstrations. Around these Sheldon integrates in an educationally correct floor plan all the teaching facilities you need. Special activity benches. Power tools. Project areas. Everything for maximum learning and teaching efficiency – in minimum space.

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ORGANIZATION

(Continued from page 174)

this intrusion and often rebel. Provision should be made for this type of work to be done in specific areas.

The assignment of work stations and the location of these stations relative to tools and materials and supervision will provide a foundation for a harmonious shop atmosphere. Constituting the framework of the disciplinary structure is the method by which the class period is begun and by which students are later organized for cleanup and dismissal.

After entering the classroom, students should report directly to their assigned work stations. Class roll can then be taken easily by checking unoccupied stations.

The shop class should not begin without the instructor first outlining the activities planned for the period. For example, if a demonstration will take place later in the period, the instructor should mention this fact before the students begin work. In this way, the students will know what to expect, and will not be disgruntled about leaving their work when called together later for the demonstration.

Announcement of planned activities or any oral instruction, for that matter, should take place only when the group is quiet. To do otherwise is poor procedure, from at least two points of view. Not only is it difficult for the instructor to be heard above noise, but resultant confusion also invites discipline problems. Should students discover that the instructor will condone this behavior, they justifiably assume that such activity is normal. Soon the situation develops into one of horseplay and rowdiness.

After giving oral instructions, the instructor should have a definite plan for beginning each day's work. For example, those students assigned to such jobs as checking the tool panel for missing tools should do so before the entire class is permitted to leave their stations. Before releasing them to begin work, it is often a good idea for the teacher to ask some of the more mischievous just what their plans are for the period. Having responsibility for their actions thus thrust upon their shoulders will often motivate them toward better behavior.

The cleanup period is often a prime opportunity for disorder and mischief. Much of this can be eliminated by a good personnel assignment plan, a plan which will embody the following principles:

1. All duties should be practical in nature. Any assignments not really necessary should not be included. No *busy work* should be assigned.

2. All duties should be clear and detailed. Students have to understand the assignments in order to complete them properly.

3. The personnel plan should clearly perfect the identification of responsibility. It will then be easy for the teacher or student supervisor to determine which students are not fulfilling their assigned duties.

4. The personnel plan must be democratic in function. Students should have equal opportunity to perform the varied tasks of the assignment plan. That is, a student should not be kept on one cleanup assignment for the entire course simply because he perfoms the job well. This alternation of assignments is perhaps best accomplished by a rotation-type plan.

Any time and effort required to devise an efficient personnel assignment plan are time and effort well spent because under such a plan, the cleanup period is no longer a time of petty bickering and disorder.

Before dismissing students at the end of any period, the instructor should have each return to his assigned station. When the dismissal bell sounds, the students may be either excused as a class or in groups, depending on their ability to leave in an orderly manner. The instructor may stand at the door if he feels that this safeguard is necessary to discourage running and shoving.

Incorporation of these organizational suggestions into any industrial-arts shop will mean time saved, more work accomplished, and a better social climate developed. The students soon acquire a healthy regard for the learning that takes place in a classroom where organization minimizes the occurrence of disciplinary disturbances.

NATIONAL SCIENCE FOUNDATION GRANTS AWARDED

The National Science Foundation has announced the award of the following 30 basic research grants totaling $380,075 at 18 sponsoring universities of ORINS (Oak Ridge Institute of Nuclear Studies):

A and M College of Texas. Warren Rice, "Transfer Coefficients at Low Velocities," one year, $9,500.

Alabama Polytechnic Institute. H. E. Sauberlich, "Role of B Vitamins in Bio-synthetic Pathways of Microorganisms," three years, $18,500.

Catholic University of America. Eugene Lukacs, "Mathematical Statistics," two years, $5,000.

Duke University. Lewis E. Anderson, "Renovation of the Grout Reference Slide Collection," two years, $8,500. John J. Gergen, "Topics in Analysis and Topology," two years, $21,800. Aubrey W. Naylor, "Relation of Biochemical Differentiation and Chloroplast Morphogenesis to Initiation of Photosynthetic Process," three years, $9,000. H. Sponer, "Electronic Structure of Molecules," two years, $23,800.

Emory University. Frank W. Fales, "Alkali-Insoluble Reserve Carbohydrate of Yeast Cells," two years, $12,000. Elliot Juni, "Mode of Action of Diphosphothiamin in Carbohydrate Metabolism," six months, $1,900.

Louisiana State University. E. V. Schenkman and H. Jacob, "Endomorphism Semigroups," two years, $22,000.

Rice Institute. C. F. Squire, "Low Temperature Physics," two years, $26,400. Roy V. Talmage and Allen C. Enders, "Phenomena of Implantation Delay in Armadillo Blastocyst," three years, $24,600.

Southern Methodist University. William B. Stallcup, "Serological Techniques in Avian Taxonomy," two years, $2,800.

University of Alabama. Joseph C. O'Kelley, "Cellulose Synthesis of Lyophilized Preparations of Acetobacter Xylinum," two years, $11,500.

University of Florida. T. M. Reed, "Viscosity of Liquid Mixtures Containing a Fluorocarbon as One Component," two years, $13,900.

University of Maryland. Henricus G. Kuypers, "Research on the Brain Stem Reticular Formation," two years, $10,400. Daniel A. Livingstone, "Late-Pleistocene Development of Freshwater Lakes," two years, $8,300. Howard E. Winn, "Behavior of Pisces-Percidae," three years, $8,300.

University of Miami. Lauren C. Gilman, "Variation in Paramecium Caudatum," two years, $5,000. Gilbert L. Voss, "Cephalopods of the Philippine Islands," two years, $5,600.

University of North Carolina. Harold J. Evans, "Oxidative Processes in Leguminous Plants," three years, $25,000.

University of Oklahoma. Charles C. Carpenter, "Ethological Studies of Reptiles," three years, $14,200.

University of Tennesee. O. G. Harrold, Jr., "Generalization of the Schoenfliess Extension Theorem," three years, $16,100. D. Frank Holtman, "Role of Amino Acids in the Host-Parasite Relationship," two years, $10,500. A. J. Sharp, "Vascular Plants of Tennessee," one year, $975.

University of Texas. Earnest F. Gloyna, "Effect of Preaereation Upon the Treatment of Sewage," one year, $5,900.

University of Virginia. Walter S. Flory, Jr., "Phylogeny in the Amaryllidaceae," three years, $10,200. Robert E. Lutz, "Stereochemistry and Effectiveness of Conjugation in Chalcones and Related Systems," three years, $20,300.

Vanderbilt University. Leon W. Cunningham, "Enzymatic Hydrolysis and Chemical Properties of Purified Glycoproteins," three years, $15,000.

ASSOCIATION NEWS

(Continued from page 6A)

invited to view the projects. Outstanding articles will be selected for entrance in the national Ford Motor Company Student Craftsman Fair to be held at Dearborn, Mich., during July.

Joseph Slyva, Industrial Arts Consultant for the Newton Public Schools, is the general chairman of the Projects Fair, assisted by Walter White, Robert Irving, Jack Sinewitz, Paul Roberts, Emile Keiler, H. Ward Mangue, Albert Studer, Edwin Frye, Henry A. Lambert, and Herbert B. Downs, all Newton industrial-arts teachers.

The newly elected officers of the Massachusetts Industrial Education Society are: president, Leo Gittzus, Lexington; vice-president, Arthur Stickler, Natick; secretary, Gerard Antonellis, Stoughton; and treasurer, Robert Irving, Newton, Mass. — *Herbert B. Downs, publicity chairman.*

GREENLEE 22 SOLID-CENTER AUGER BITS

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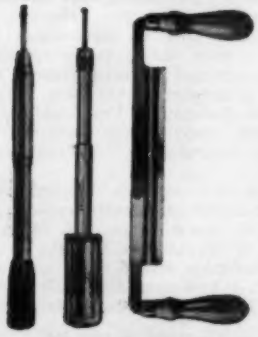

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Personal News

ROBERT HELSBY APPOINTED ACTING DIRECTOR

Robert Helsby has been appointed acting director of the industrial arts division of State University of New York Teachers College at Oswego, N. Y., effective on July 1, 1957. He will replace Dr. Gordon Wilber, who is retiring this year.

Mr. Helsby is an Oswego industrial-arts graduate, Class of 1940, and has been on the college staff since 1946. While at Oswego, he has taught general metal, woodworking, driver education, and mechanical drawing. He has also acted as executive director of the Oswego Alumni Association; and served as assistant to the president and director of public information. Previously he was supervisor and taught industrial arts in Cato-Meridian Central School.

Robert Helsby

His career has been interrupted on two occasions for military service.

He received his B.S., from Oswego where he was graduated first in his class; his M.A., from Ohio State University; and has done graduate work toward his Doctorate at Ohio State, Indiana, Penn State, and Cornell University. He is now on sabbatic leave at Cornell to complete requirements for his Doctorate.

Among the many professional organizations of which Mr. Helsby has been a member are: American Industrial Arts Association, New York State Practical Arts Association, Central New York Industrial Arts Association, New York State Teachers Association, American Vocational Association, and Epsilon Pi Tau and Iota Lambda Sigma, Industrial Arts Honorary societies.

FRANK E. SCHNEIDER RETIRES

Frank E. Schneider, associate professor of industrial-arts woodworking at State University of New York Teachers College, Oswego, N. Y., will retire at the end of the academic year in June.

He joined the college faculty in 1926, after completing the course for industrial-arts teachers at Oswego in 1922. He taught industrial arts four years in Hazeltown and Scranton, Pa., Junior and Vocational High Schools before coming to Oswego.

He also took courses at Cornell University, Penn State, Oswego, Syracuse, and New York University. He received the B.S. degree in Education at Syracuse University in 1935 and the M.A. degree at New York University in 1937.

Mr. Schneider has taught courses in general woodworking, wood finishing, cabinetmaking, and boatbuilding. During World War II he taught courses in aircraft woodworking at Oswego and glider construction at Cornell University.

Frank E. Schneider

A series of five monographs on carpentry were coauthored by Mr. Schneider, which were widely used in Government Service training courses during the war, and since then in vocational carpentry training courses.

He is a member of the New York State Education Association, Vocational Education Association, State College Faculties Association, and Central New York Industrial Arts Club.

He was very active in designing and constructing model speed boats and the gasoline engines to power them, and competed in regattas in Washington, Detroit, New York, and Philadelphia several years with some of his models exceeding fifty miles per hour speeds. He also has worked on full scale speed

(Continued on page 26A)

C&P NEW SERIES PRESSES These presses in sizes of 8x12, 10x15, 12x18 and 14½x22, provide the student with equipment that furnishes all practical requirements of hand fed press operation. May be equipped with flywheel, belt and platen guards. Also furnished for treadle operation instead of motor drive.

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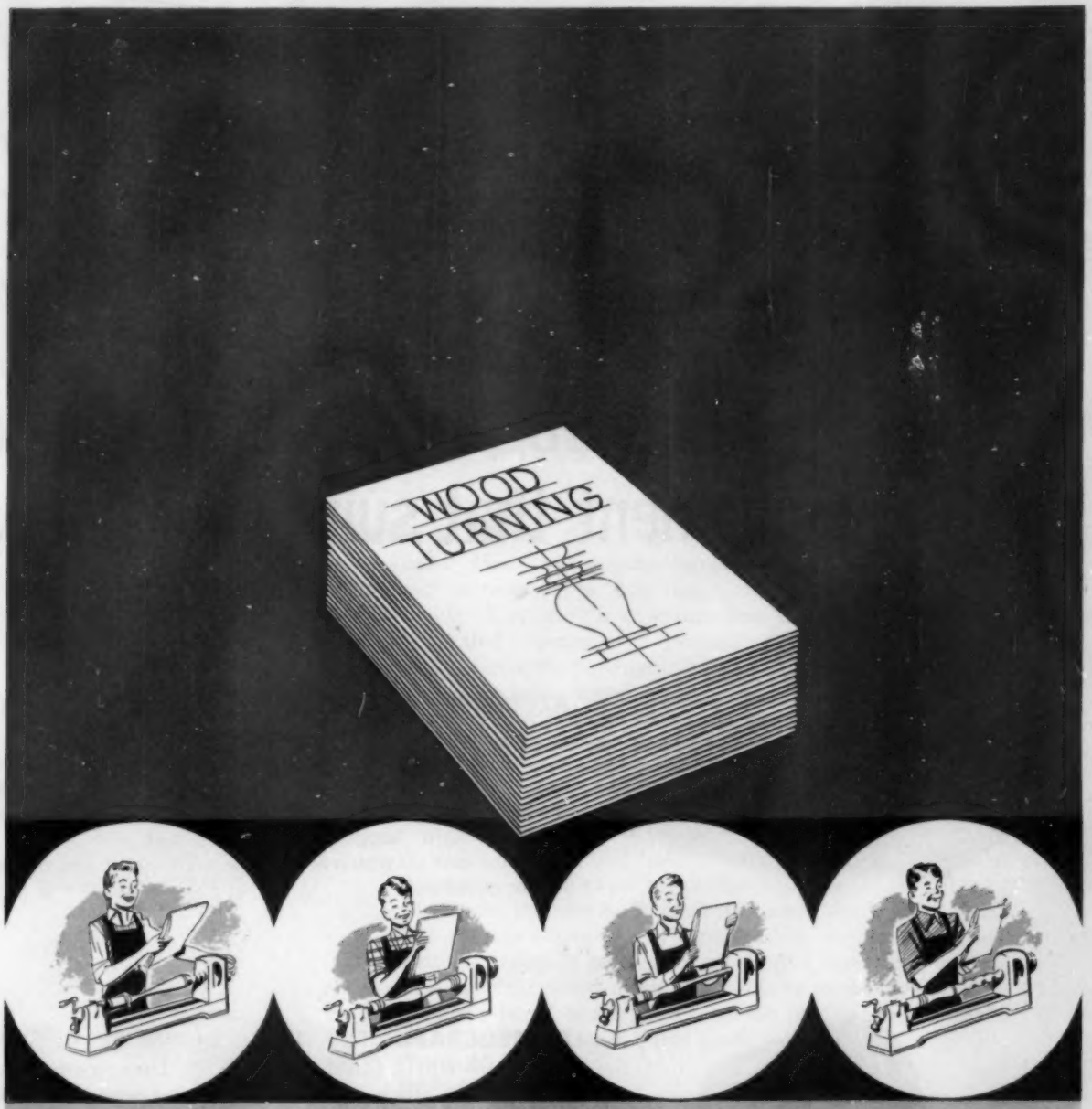

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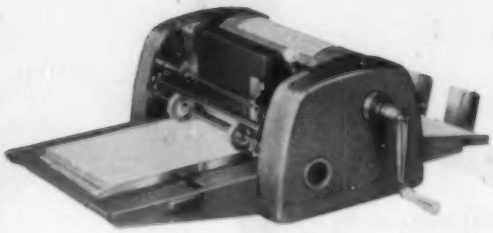

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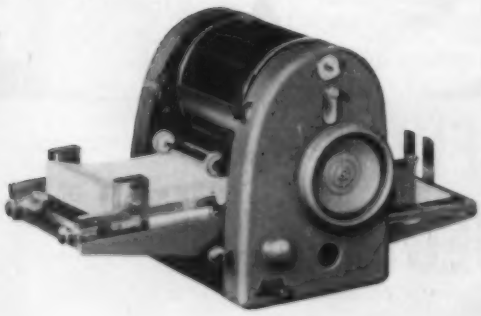

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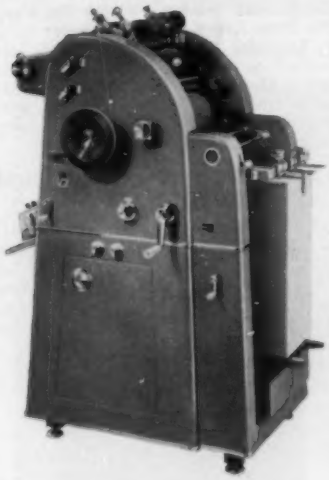

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PERSONAL NEWS

(Continued from page 22A)

boats which have competed in National Gold Cup races.

Upon his retirement from 35 years of teaching, Mr. Schneider aims to sell his home in Oswego and work on boats at Pilot Knob on Lake George where he has a summer home.

MARSHALL L. SCHMITT IN NEW POST

Dr. Marshall L. Schmitt, associate professor of industrial arts at North Carolina State College, Raleigh, from 1949 to January, 1957, has accepted the position as Specialist for Industrial Arts in the Department of Health, Education and Welfare, U. S. Office of Education, Washington, D. C.

Dr. Marshall L. Schmitt

Dr. Schmitt was born January 23, 1919, in Rochester, N. Y. His formal education consisted of graduation from the East Rochester High School, East Rochester, N. Y., 1937; the B.S. degree from Oswego State Teachers College, Oswego, N. Y., 1941; the M.S. degree from Ohio State University, Columbus, Ohio, 1947; and the Ed.D. degree from Pennsylvania State College, State College, Pa., 1953.

His experience consists of being an instructor in mechanical drawing and industrial arts at the Red Creek Central School, Red Creek, N. Y.; he was Group Senior Instructor with the Federal Civil Service, Lincoln, Neb.; he served in World War II aboard the U. S. S. Xenia as a 1st Lieutenant in the U. S. Navy; he was Instructor in Metals and Electricity at the Oswego State Teachers College, Oswego, N. Y., from 1946 to 1949; and then became Associate Professor of Industrial Arts at North Carolina State College.

Dr. Schmitt is active in many national organizations. He is a member of the American Industrial Arts Association (chairman, AIAA Curriculum Committee), American Vocational Association, American Council on Industrial Arts Teacher Education, Epsilon Pi Tau (has received laureate citation), Kappa Phi Kappa and Phi Delta Kappa. He is a member of the North Carolina Industrial Arts Association (has served as secretary-treasurer), and was awarded a life membership in this association because of the many contributions he made. He also served on many college and school of education committees.

TEXAS INDUSTRIAL ARTS TEACHER OF THE YEAR

W. A. Mayfield, head of industrial-arts at Snyder, Texas, was elected "Industrial Arts Teacher of the Year." The selection was made at the Ninth Annual Industrial Teacher Conference which was recently held at Texas A. and M. College, College Station, Tex.

W. A. Mayfield

Mr. Mayfield is a graduate of the industrial education department, Texas A. and M. College. He received his bachelor's degree in the spring of 1949, and his master's degree in August, 1950. Since that time, he has taught industrial arts in the public schools of Texas.

He was quite instrumental in organizing the Texas Industrial-Arts Association. He served as temporary chairman during the organizational period, later he was elected president and served a period of one year in that position.

In addition to his activities in Industrial arts, he is a former vice-president of Industrial arts in the Texas Vocational Association. He is also a member of Iota Lambda Sigma which is an industrial education honorary fraternity.

(Continued on page 28A)

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PERSONAL NEWS

(Continued from page 26A)

DR. YOUNG RECEIVES APPOINTMENT

Appointment of Dr. Talmage Brian Young as associate professor of industrial arts in North Carolina State College's School of Education, Raleigh, N. C., was announced lately by Dr. J. Bryant Kirkland, dean of the school, and Dr. Ivan Hostetler, head of the Department of Industrial Arts.

Dr. Young replaces Dr. Marshall L. Schmitt who resigned his State College post to become an industrial-arts specialist for the U. S. Office of Education in the Department of Health, Education, and Welfare, Washington, D. C.

A native of Fitzgerald, Ga., Dr. Young comes to State College from Berry College at Mount Berry, Ga., where he has served as chairman of the Division of Industrial Arts and Industrial Education since joining the college staff in the fall of 1953.

Appointment of Dr. Young to the post was approved previously by President William C. Friday of the Consolidated University of North Carolina, Chancellor Carey H. Bostian of State College, and the executive committee of the Board of Trustees.

Educated in the public schools of Georgia, Dr. Young received his B.S. degree in industrial arts from Berry College in 1940. Following teaching assignments in the public schools of Chattanooga, Tenn., Dr. Young worked for a time with the National Youth Administration in Georgia.

Entering the U. S. Army Air Force in 1943, Dr. Young subsequently served as a bombardier in the China, Burma, India theater of military operations, and was discharged with the rank of First Lieutenant early in 1946.

Following several years of work in teaching, private business, and for industry, Dr. Young received his B.S., M.A.E., and Ed.D. degrees from the University of Florida, the latter in 1953.

Graduated with honors from both Berry College and the University of Florida, Dr. Young is a member of Phi Kappa Phi and Phi Delta Kappa. He has been active in both educational and civic affairs while at his post at Berry College.

RAYMOND V. NORD RECEIVES APPOINTMENT

Raymond V. Nord has been appointed director of Vocational Education and consultant in Industrial Arts for the city of Minneapolis, Minn. He replaces John F. Robohm who retired this winter.

Mr. Nord earned his bachelor of education degree at St. Cloud Teachers College and the University of Minnesota; and received his master of arts degree from the University of Minnesota.

His teaching experience includes three years at the New York Mills High School — industrial education and mathematics; two years at the International Falls High School — industrial education and agriculture; adult evening instruction in wood shop, sheet metal, and drafting at International Falls, Minn., and Fort Francis, Ontario; twenty-five years in the Minneapolis public schools which embrace: ten years, industrial-arts instructor, Folwell Junior High School; four years, director of the war-production training program; one year, assistant director of vocational education and industrial education; and ten years as principal of Minneapolis Vocational High School and Technical Institute.

He has served as chairman of the Human Resources and Skills Committee of the Minneapolis Defense Council; as chairman of the Training Division of the Minneapolis War Work Emergency Committee; and is currently president of the Minnesota Council of Local Administrators of Vocational Education and Practical Arts and a member of the legislative committee of the Minnesota Vocational Association.

BRADLEY UNIVERSITY TEAM IN BAGHDAD, IRAQ

Bradley University of Peoria, Ill., has a Technical Education Team in Baghdad, Iraq, under contract with the International Cooperation Administration.

The primary duties of this team consist of (1) the development of a technical institute in Baghdad; (2) teacher training in the vocational-technical schools in Iraq; and (3) advising the Iraq Ministry of Education in the various specializations represented by the team.

Chelsea Bailey, formerly of Ohio Mechanics Institute, is director.

The assistant directors are: F. Ray DeForest, Clifford C. Fox, Dr. Wayne Ramp, Samuel E. Russell, Harold Snidow, and Waino Thompson.

EDUCATION ADVISERS NAMED BY MCA

Elbert C. Weaver, instructor in chemistry on The George Peabody Foundation at

(Continued on page 30A)

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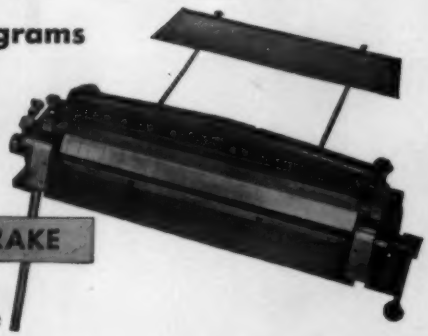

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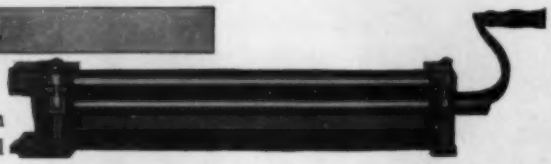

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PERSONAL NEWS

(Continued from page 28A)

Phillips Academy, Andover, Mass., has been appointed senior education adviser for the Manufacturing Chemists' Association, Washington, D. C.

Dr. James K. Hunt, formerly of The DuPont Company, has been named education adviser.

Both men will assist in the development and execution of MCA's expanding aid-to-education activities, devoting special attention to work on the program for teachers and students of senior high school chemistry. They join Dr. William E. Chace, director of education, who for the past two years has been in charge of the over-all program which is conducted with the guidance of a 22-man Education Advisory Committee.

Mr. Weaver will serve on a part-time basis for the present through an agreement with Phillips Academy, where he has been a teacher since 1943. He is well known for his work with students, and also as an author of textbooks and technical articles, as an educational consultant to industry, and as an authority on visual aids in the field of chemistry.

Dr. Hunt recently retired as technical and educational advisor of the DuPont Company's Public Relations Department after 30 years of service. Like Mr. Weaver, Dr. Hunt is the author of numerous technical papers.

J. DENTON FLOYD PRESIDENT OF O.I.A.A.

J. Denton Floyd, chairman of the Industrial Arts Department at East Central State Normal School, Ada, Okla., is the new president of the Oklahoma Industrial Arts Association.

He is a native son of Oklahoma and has served the industrial education program for a long period of time without changing locations. He was born at Asher, Okla., October 10, 1905, and moved to Ada, Okla., when he was five years old. He entered school in the training school division of the East Central State Normal. He received his bachelor of science degree from East Central State Teachers College in 1926. He had taught industrial arts one year at Sulphur before completing his degree. When he completed his degree he was offered a place in the Department at East Central as teacher in woodwork and assistant in the training school. He has remained with the training school and with the department since, except for time off for graduate work. He completed his master's degree at Iowa State College in 1929.

In June, 1956, Mr. Floyd became chairman of the Industrial Arts Department at the East Central Normal School.

HARRY HALSTEAD IN NEW POSITION

Harry Halstead has been appointed as an assistant in charge of special services by Lloyd Andrews, newly elected State Superintendent of Public Instruction, Washington. In this new position Mr. Halstead will work in the field of Civil Defense, Conservation, and Vocational and Industrial Arts Education.

Mr. Halstead was formerly director of vocational education under Pearl A. Wanamaker, at that time superintendent of schools for the state of Washington.

WILLIAM R. WOODFIN RECEIVES APPOINTMENT

William R. Woodfin has been appointed state supervisor of trade and industrial education in the Arizona State Department of Vocational Education. He replaces Louis McElroy who resigned last fall.

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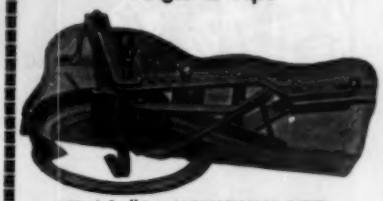

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PERSONAL NEWS

(Continued from previous page)

Mr. Woodfin will be responsible for providing leadership in both the Trade and Industrial Education and Industrial Arts program in Arizona. He holds a bachelor of science degree from Middle Tennessee State College with a major in industrial arts. He also holds a master of science degree in Industrial Education from the University of Tennessee.

He taught three years in the Oak Ridge High School in Tennessee, and taught crafts in the Oxnard Union High School at Oxnard, Calif., last year. He is employed as industrial-arts teacher at Camelback High School this year. He is a journeyman carpenter with approximately five years' experience in the trade.

Mr. Woodfin has served in the United States Infantry from March, 1943 to December, 1945.

His fraternal affiliations include: Iota Lambda Sigma, Epsilon Pi Tau, and Phi Delta Kappa. He is a member of the American Vocational Association, and is a life member of the National Education Association.

DR. KIRK, EDUCATOR, DIES

Dr. Raymond Kirk, dean of the graduate school of Polytechnic Institute of Brooklyn, N. Y., died recently after a brief illness in Long Island College Hospital.

Dr. Kirk had joined the Institute faculty in 1931 as head of the chemistry department, and became dean of the graduate school in 1944. He was coeditor of the Encyclopedia of Chemical Technology.

He is survived by his wife and two daughters.

♦ B. J. Dennis, New York University Alumnus of 1948–49, who is at present with the public schools of Oakland, Calif., has been appointed to a part-time post as woodwork consultant in the Occupational Therapy Department of Mills College, Oakland, Calif.

♦ G. Harold Silvius, College of Education, Wayne State University, Detroit, Mich., spent February 13 to 15 in Washington, D. C., with the Administrative Cabinet of the Industrial Arts Division of the American Vocational Association. He has accepted the responsibility of soliciting and editing manuscript for the American Vocational Journal devoted to industrial arts.

Dr. Silvius has directed also the planning, and served as general chairman on April 18 in Kansas City, Mo., during the convention of the American Industrial Arts Association, where the topic and discussion was focused on "The Implications of Twentieth Century Industrial Technology for Industrial Arts."

♦ William A. Murray, for almost 21 years head of the Virginia Polytechnic Institute Electrical Engineering Department, has resigned that post, although he will continue to teach in the department.

B. M. Widener, professor of electrical engineering at Virginia Polytechnic Institute since 1930, has been named to serve as acting department head.

♦ Patrick R. Pinto, instructor at School No. 87, Buffalo, N. Y., died on October 6, 1956, at Veterans Hospital, Buffalo. He was graduated from Buffalo State Teachers College in 1940.

Mr. Pinto was past president of the Western New York Industrial Arts Club (1953).

♦ Dr. Thomas S. Weir, graphic arts professor at Santa Barbara College, Santa Barbara, Calif., is on a two-year assignment for the Department of State in Beirut, Lebanon.

(Continued on next page)

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TWELVE BRAND-NEW MICROMETER CALIPERS with traditional Brown & Sharpe quality and accuracy are now available for young machinists . . . at worthwhile savings in price. These are the same professional instruments preferred by so many experienced craftsmen . . . offered at a new low cost because economical hardened tool steel is used instead of carbide in the measuring faces. They are ideal for student work or any uses where extra long life under abrasive measuring conditions is not required.

In young hands these easy-handling, fast-reading micrometers help do every job better . . . build up the student's pride in accurate work because he knows he's using one of the finest measuring tools made!

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PERSONAL NEWS

(Continued from previous page)

♦ GLENN S. DUNCAN, formerly associate professor of industrial arts, Eastern Illinois State College, Charleston, Ill., is now professor of industrial-arts education at Chico State College, Chico, Calif. He has been in his new position since September, 1956.

♦ Included in the January graduating class of Stout State College, Menomonie, Wis., were 37 persons. Of these, six are women receiving the bachelor of science in home economics education, and 26 are men receiving that degree in industrial education. The other five are persons who have earned the master of science degree.

♦ GUIDO DETRA has joined the teaching staff of the industrial arts department at St. Cloud State Teachers College, St. Cloud, Minn. He was formely a teacher in Foley, Minn., and had lately been the supervisor of industrial arts in Boulder, Colo. He holds a master's degree from the Colorado State College of Education, and has completed a year of work toward his doctorate at the University of Colorado.

♦ HAROLD MATTSON, instructor at Southern School of Agriculture in Waseca, Minn., was awarded $500 by the Lincoln Foundation for a paper entitled, "Increased Uses of Electrical Welding."

♦ RALPH C. MAYO, a teacher-coach at South High School, Worcester, Mass., and formerly vocational instructor at Worcester Boys' Club, has recently accepted a position with Worcester Academy teaching blueprint reading and woodworking. To do this Mr. Mayo gave up the work with the Boys' Club.

♦ GLEN M. LARSON, formerly an instructor in the trades department at Santa Ana College, Santa Ana, Calif., is now in the Philippine Islands as instructor in machine shop under a contract between Stanford University and the Philippine Department of Education.

OUTSIDE-OF-SCHOOL INDUSTRIAL ARTS ASSIGNMENTS

BERNARD WRAY
Instructor of Industrial Arts
Senior High School
Port Chester, N. Y.

The industrial-arts teacher in general has met with little success in presenting outside-of-school assignments to his students. A critical examination of this problem shows that a partial solution can be found to the question.

All well-prepared assignments have certain essential characteristics. The assignment not having these is likely to be a failure. Listed below are several of these essentials. All of them should be involved in planning the assignment.

The assignment should:

1. Motivate interest.
2. Be a reasonable challenge to the student.
3. Fit objectives and circumstances.
4. Be clear and precise.
5. Be related to former learnings.
6. Be related to future learnings.
7. Indicate sources of reference.
8. Fit the current needs of the pupil.
9. Fit the future needs of the pupil.

The day of the formal classroom is past. Now we realize that each child is an individual and must be treated as such. In this way, our society will achieve the maximum of its potential. Assignments geared to the individual's ability, background, personality, and conditions of the local community must be planned and executed.

Although there is no set rule, it is widely agreed among educators that it is better to present the assignment to the class at the beginning of the period. The instructor will then be able to take as much time as is needed for discussion in order that the students will thoroughly understand the problem involved. The assignment given at the end of the period is often hurriedly presented. Many times the student's mind is on some other item of interest then, and he does not fully comprehend what is being presented.

We should not think of the assignment as an end, but as a means to the end, a steppingstone, a method of motivation. The assignment should appeal to and fulfill the biological, psychological, and sociological needs of the student. Pupil participation in selecting and developing topics and methods of procedure is most desirable. The teacher should dramatize the problem in order to build up an enthusiastic motivation in the individual as well as in the group.

Seven broad types of assignments that the industrial-arts teacher may readily use are shown in the list that follows. These are reading, writing, arithmetic, planning, manipulation, observation, and communication. Several of these may be integrated into one problem. The first three types, reading, writing, and arithmetic, are basic. These we cannot do without. They are essential in all modern societies. Examples of uses of these are included in the following list.

Types of Assignments

I. *Reading*
   - *a*) Use of libraries (shop, school, public).
   - *b*) Reading textbooks.
   - *c*) Reading newspapers and periodicals.
   - *d*) General research.

II. *Writing*
   - *a*) Keeping of notebooks.
   - *b*) Preparing compositions and research papers.
   - *c*) Preparing book reports.
   - *d*) Writing business letters.

III. *Arithmetic*
   - *a*) Solving mathematical problems (prepared by teacher and /or pupils).
   - *b*) Solving workbook problems.
   - *c*) Construction of charts and graphs.
   - *d*) Application of measuring instruments.

The next four types listed, planning, manipulation, observation, and communication, are especially applicable to the industrial-arts curriculum. These are an important if not necessary type of assignment for students to perform in our American industrial society of today. They are perhaps the beginning of the solution of our initial problem of finding the successful assignment for industrial-arts students. Examples of these types of assignments are also listed below.

IV. *Planning*
   - *a*) Reasoning.
   - *b*) Designing.
   - *c*) Sketching.
   - *d*) Instrument drawing.

V. *Manipulation*
   - *a*) Making scrapbooks.
   - *b*) Home repair work.
   - *c*) Project construction.
   - *d*) Using home workshops.

VI. *Observation*
   - *a*) Visits to industrial plants, museums, retail establishments, sites of natural resources.
   - *b*) Viewing motion pictures and television.
   - *c*) Visiting places of common interest.

VII. *Communication*
   - *a*) Personal interviews.
   - *b*) Community surveys.
   - *c*) Telephone conversations.
   - *d*) Radio and television programs.

Reading, writing, and arithmetic are basic, necessary types of assignments and by no means obsolete. Teachers in general, however, have not had successful results from these alone. By broadening out the assignments to include planning, manipulation, observation, and communication types we ought to have superior outcomes. These types fit our society and our times.

The suggestions outlined in the foregoing, are, of course, only some of the possibilities in this area, but they do show how the outside preparation or assignment can be made more meaningful.

"SPECIFICATIONS FOR METAL LATHING AND FURRING"

The 1957 award-winning edition of "Specifications for Metal Lathing and Furring" is ready for free distribution by the Metal Lath Manufacturers Association.

Granted a "Certificate of Merit" in the 1957 Building Products Literature Competition, sponsored jointly by The American Institute of Architects and The Producers' Council, Inc., this explanatory 20-page booklet covers all phases of metal lath construction.

(Continued on page 34A)

How do your projector maintenance costs compare with these averages?

Recently we surveyed a number of 16-mm-projector owners and service shops to learn how much it costs to maintain Kodascope Pageant Projectors in top working order.

We found—as you, too, will find—that Pageant maintenance costs are surprisingly low.

Typical case histories show dollars and cents of low-cost Pageant Projector maintenance

1. It takes only 57 minutes per year, on the average, to service each of the 55 Kodascope Pageant 16mm Sound Projectors used by one large Midwest school system. Parts cost just $1.45 per year per unit, average. Average yearly use per projector, *720 hours! ! !*

2. No annual repairs on 8 Pageant Projectors for three years is the report from a New York business firm with a fleet of 15 machines. The remaining 7 units needed only minor repairs during the three year period.

3. A fleet of 38 Pageants, operating about 500 hours per year, averaged only $2.47 per year per unit for replacement parts! Service time per year, one hour 30 minutes.

4. After 855 hours' use per year, average, replacement parts cost just $3.03 per Pageant Projector. Labor per unit, one hour 15 minutes average. This is what one large Southwestern dealer and service shop reports after keeping records for two years.

5. 1500 hours with no time lost for repairs—that's what a West Coast coordinator of A-V services reports. His school system owns *six* Pageant Projectors, which have cost less than $10.00 to maintain—about $1.67 per machine.

WHY PAGEANT COSTS ARE SO LOW

The simplicity of Pageant Projector design is one major low-maintenance factor. A Pageant Projector has fewer working parts to wear out, fewer to clean or adjust. And it runs at lower pulldown-shaft speeds; less vibration and wear is the result.

Pageant Projector simplicity makes minor maintenance jobs simpler, too. Parts are easy to get at.

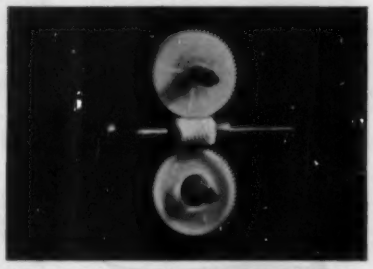
NO OILING NEEDED

You never have to oil a Pageant Projector. It is permanently lubricated at the factory. This completely eliminates the most common cause of projector breakdowns—over- or underoiling.

READY WHEN YOU NEED IT

Why should you miss showing a good film at the right psychological moment because of needless projector breakdowns? Your trouble-free Pageant is ready to roll any time you need it.

Ask your Kodak A-V dealer for a free demonstration. See Pageant Projector picture brilliance and sharpness. Hear the superb sound reproduction. Try the simplified setups. Choose from three basic models designed to fit your needs and budget.



No more oiling worries; nylon gears, oil-impregnated bearings, etc., give you *permanent* prelubrication.

For complete service accessibility, the amplifier and projector mechanism are easily removable.

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Kodak

METAL LATHING AND FURRING

(Continued from page 32A)

Included are: specifications for solid and hollow partitions; wall furring; metal lath attached directly to wood supports; contact, furred, and suspended ceilings; beam and column protection fireproofing and reinforcing for exterior stucco.

A page devoted to fire-resistive ratings and descriptions of construction depicts the protection of structural steel members and assemblies. Both hollow and solid partitions are listed.

The various spans and spacings for supporting metal lath and plaster ceilings have been summarized in descriptive tables.

Appearing in the 1957 issue of Sweet's Architectural File, reprints of "Specifications for Metal Lathing and Furring" are available without charge from the *Metal Lath Manufacturers Association, Engineers Building, Cleveland 14, Ohio.*

THE NEED FOR NEW AND BETTER ENGINEERING TALENT

The American Society for Engineering Education, University of Illinois, Urbana, Ill., will conduct a major study of recruiting, developing, and utilizing engineering faculties, to endeavor to meet the nation's need for new and better engineering talent.

Dr. Harold L. Hazen, dean of the Graduate School at the Massachusetts Institute of Technology, is chairman of the ASEE's new committee on the Development of Engineering Faculties; and Dr. William H. Miernyk, director of the Bureau of Business and Economic Research at Northeastern University, is the Executive Director of this project.

The effort of the committee's assignment to study and recommend solutions to the problem, will take three directions:

1. To survey what is known and to develop additional information required to measure quantitively the need for new engineering teachers.

2. To identify and study the problems to be solved in meeting this need — the financial problem, the conditions required to make college teaching competitive with other engineering careers, the unique satisfactions and rewards of the teaching profession.

3. To initiate and encourage activities, based on the program's findings, to increase the supply and quality of engineering teachers.

Dr. William L. Everitt, dean of the College of Engineering at the University of Illinois, and president of the American Society for Engineering Education, noted the nation's critical need for more and better qualified engineering graduates, and he points out the urgent problems faced by the engineering colleges in retaining their present staffs and recruiting and developing new teachers from past, present, and future graduates.

In addition to Dean Hazen, members of the project's executive committee are Dr. Joseph C. Boyce, vice-president and dean of the Graduate School at the Illinois Institute of Technology, Chicago; Dean Gordon B. Carson of the College of Engineering, Ohio State University, Columbus; Morris D. Hooven of the Public Service Gas and Electric Company of New Jersey, Newark, also president of the Engineers Council for Professional Development; and Dr. William C. White, vice-president of Northeastern University, Boston.

As the project develops, this executive committee will be supplemented by working groups on specific assignments and by a larger central committee.

News Notes

FORD MOTOR COMPANY I.A. AWARDS

Judging of more than 40,000 entries in the Industrial Arts Awards annual competition sponsored by Ford Motor Company will begin in May at Student Craftsman's Fairs in nearly 50 cities in the United States and its territories, and Canada.

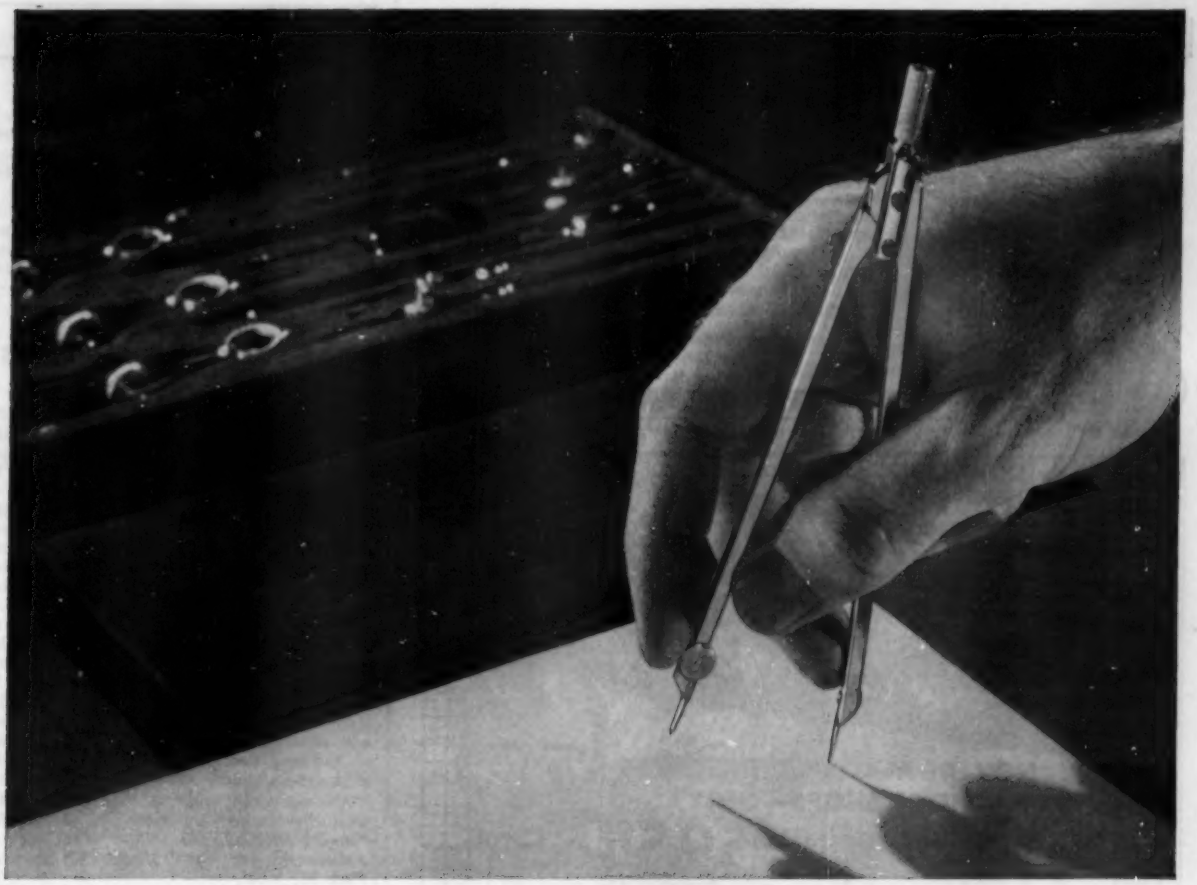
Approximately 5000 projects which win top ratings in local exhibits will be sent to Dearborn, Mich., for final judging in mid-July.

Projects are entered in 14 divisions, and each exhibitor competes in his own junior or senior high school class level. The divisions are: mechanical drawing, woodworking, electrical, graphic arts, leather, ceramics, jewelry, models, wrought metal, patternmaking and molding, plastics, machine shop, architectural drawing, and an open division for entries not included in the special categories.

Cash prizes and certificates are awarded winners of first, second, third and fourth places, and six honorable mentions. First prize is $100; second prize, $80; third prize, $60; fourth prize, $40; and each honorable mention, $20. Ford motor Company which is now in its eighth year as sponsor of the IAA, has set aside $50,000 for cash prizes.

Judges who select the final winners also will select 31 projects to be given Outstanding Achievement Awards — highest honor in the national competition.

(Continued on page 36A)



QUESTION: How to tell which drawing instrument set is the better buy?

Answer: *By checking these four characteristics:*

HOW AN INSTRUMENT FUNCTIONS

Carefully examine an instrument's ease of operation and its basic construction features. For example, open and close a POST divider and see how *smoothly* it works. Notice how it *holds position* when open. Look closely at the self-centering gear head and see how this patented feature permits accurate settings with *minimum leg play*.

Next, try a POST bow. Work the adjusting screw and observe the fit between the screw and its threads. There is virtually *no play in the adjustment.* These characteristics are the mark of a "better buy".

HOW AN INSTRUMENT LOOKS

Appearances are often deceiving. Nevertheless, you should make it a point to examine the finish carefully on *all instruments in a set.* With POST instruments, the finish is uniform and durable. POST's base materials and carefully crafted finishes are a good indication of extra years of trustworthy service.

HOW AN INSTRUMENT FEELS

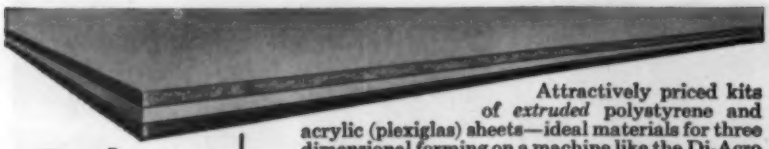
Always check the *feel* of an instrument before you buy. POST instruments, for example, are perfectly balanced and can be handled with ease and accuracy. They are neither too heavy nor too light, but are just the right weight for comfortable drawing.

HOW THE MANUFACTURER STANDS BEHIND THE INSTRUMENT

You can't dissect an instrument to determine if the best metal is used, or the accuracy of craftsmanship. You must put your final reliance on the manufacturer! That's why more people insist on seeing a POST instrument set before they buy. The POST trademark is your assurance of precision and quality—your guarantee of outstanding, long life performance and greater dollar for dollar value. *POST stands behind every instrument sold.*

For your free, illustrated 1957 SCHOOL SPECIALS BROCHURE showing special classroom prices on a wide variety of instruments and sets, write today to Educational Sales Division, Frederick Post Company, 3648 N. Avondale, Chicago 18.

POST



Package Bargains on *Extruded* Plastics

Attractively priced kits of *extruded* polystyrene and acrylic (plexiglas) sheets—ideal materials for three dimensional forming on a machine like the Di-Acro Plastics Press (not suitable for internal carving or other handicraft uses). Di-Acro sheet materials have an excellent finish and high impact resistance even after forming. Standard thicknesses of .60, .80, .100 polystyrene and plexiglas available in packages of 10, 25, and 50 sheets. Mixed packages of both materials if desired. 10 standard polystyrene colors, 5 standard plexiglas colors.

For price information please indicate on coupon at bottom of page

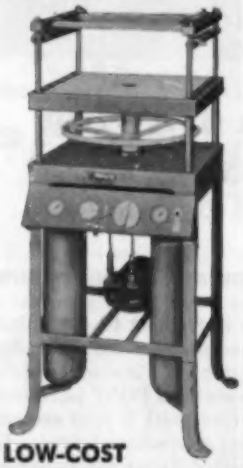
di-acro PRECISION METALWORKING MACHINES

O'NEIL-IRWIN MFG. CO.

351 8th Avenue, Lake City, Minnesota

KEEP PACE WITH INDUSTRY... offer training in plastics this low cost way

NEW, DI-ACRO PLASTICS PRESS FOR SCHOOL SHOPS—ONLY $595.00



This unusual Di-Acro plastics press enables school shops to take plastics out of the purely handicraft stage and to duplicate many creations of the modern plastics industry. The machine will perform all basic operations of the plastics forming industry—mechanical stretch forming, vacuum forming and blow forming.

A unique machine in any school shop, the Di-Acro Press fits well into conventional areas of industrial education. Students can get industrial-type experience from simple machine operation to the most advanced type of three dimensional plastics projects from student-made molds and plugs.

LOW-COST MATERIALS

Forming with the Di-Acro Plastics Press No. 18 makes use of one of the lowest cost materials on the market—the styrenes, in addition to acrylics and vinyls. A variety of colors are available in 18" x 24" sheets of both acrylic and styrene plastics in many thicknesses.

Write for free 14 minute demonstration film "FORMING PLASTIC SHEET MATERIALS" from O'Neil-Irwin Mfg. Co.

*pronounced dia-ack-ro

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PLEASE SEND:

- ☐ Plastics Press Instruction Manual
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School_____

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NEWS NOTES

(Continued from page 34A)

The owners of the OAA projects and their teachers will be given expense-free trips from their homes to Dearborn in September and will be guests of Ford Motor Company for five days.

All projects entered in the Industrial Arts Awards and Student Craftsman's Fairs must be made under the supervision of an instructor, in any public, private, parochial, or trade school. Contestants must be in grades seven through 12, and under 21 years of age.

RUBBER FLOOR DESIGN AWARDS COMPETITION

The Rubber Manufacturers Association, Inc., announce the first Rubber Floor Design Awards Competition to be held. Competition closes December 31, 1957. Awards are to be announced in March, 1958.

The Rubber Floor Design Awards Competition is open to architects, industrial designers, interior designers and decorators and flooring installers in business in the continental United States excepting the manufacturers of rubber flooring, their employees, their families, etc.

A designer's plaque and $1,500 will be awarded to the designer who is responsible for the best-designed rubber flooring installation. An installer's plaque and $500 will be awarded to the flooring contractor who installs the award winning rubber floor. There will be six honorable mentions also to designers and installers who are runners-up in the competition.

A copy of the rules and an official entry sheet may be had by writing to the *Rubber Flooring Division, The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York 22, N. Y.*

GEORGIA TECH, TENNESSEE CO-OPERATING IN RESEARCH

The Georgia Institute of Technology and the University of Tennessee are co-operating in a basic research project for the U. S. Office of Naval Research, to gain knowledge about the directions from which meteors come toward the earth.

Under a recent research contract, the University of Tennessee erected a small transmitter building and a 60-foot antenna to beam radio signals at meteor trails. Georgia Tech has made arrangements to receive and record the signals that are successful in hitting the trails and "bouncing" back to earth; the resultant information will make it possible to determine the direction in which the meteors were traveling.

UNIVERSITY OF FLORIDA PARTICIPATES IN ORSORT PROGRAM

The University of Florida is one of six universities selected for participation in a program designed to double the number of nuclear reactor specialists trained each year at the Oak Ridge School of Reactor Technology.

Two-year contracts with the designated universities provide for concentrated courses of study designed to develop specific proficiency in chemistry, mathematics, physics, and engineering for students accepted for ORSORT. Under the expanded program, the first six months of the one-year ORSORT course will be given at the participating institutions, and the remaining six months at the Oak Ridge National Laboratory, which operates the school for the Commission. This arrangement will permit two classes of 120 students each

to be trained each year, twice the number which can now be accommodated.

The university phase of the program will cover unclassified material, but the later ORSORT phase will deal with classified subjects, and will be concentrated so as to take advantage of the unique facilities and technology available at Oak Ridge.

Each of the universities has been assigned a minimum of 20 students beginning this February. Successive classes of 120 students each will be assigned to the six universities in August, 1957, February, 1958, and September, 1958. An ORSORT applicant will be asked to state university preferences, which will be honored as far as possible.

The other five universities involved are the Carnegie Institute of Technology, the Case Institute of Technology, Northwestern University, the University of California at Los Angeles, and Union College in Schenectady, N. Y.

EDUCATION FOR AUTOMATION

Education for automation — at the secondary school level — will be launched by the Pittsburgh, Pa., public schools in September. Formal approval voted recently by the Board of Public Education climaxed half a year of study and preparation by a committee of Pittsburgh area scientists and technologists working closely with top professional schoolmen.

Recruitment of teachers, at least initially, and provision of equipment and certain other needed teaching aids are among the fields in which the continued co-operation of the committee is pledged to the school authorities.

Objectives of the initial course and the course content were described in a letter and a printed folder prepared by the committee. This material was submitted to the committee on education of the Board of Public Education at its meeting on February 5. The favorable recommendation voted at that time was confirmed by the formal vote of the entire Board of Public Education on February 19.

This project will be reported on in detail at a National Conference on Automation Education (high school and college), which will be held in New York City at the Fourth International Automation Exposition, June 9 to 13, 1958.

Authorities will report on:

1. The Pittsburgh High School Plan for an Automation course.
2. Review of established courses for indoctrination in automation.
3. The technical high school approach to automation.
4. The college approach to automation.

For more details contact *Richard Rimbach Associates, Inc., Management, Fourth International Automation Exposition, 845 Ridge Ave., Pittsburgh 12, Pa.*

CAREERS IN THE MATHEMATICAL SCIENCES

An all-day conference on "Careers in the Mathematical Sciences" was held on January 5, 1957, by New York University's Institute of Mathematical Sciences. High school mathematics chairmen and vocational guidance counselors from New York, New Jersey, and Connecticut, took part.

The conference was prompted by the shortage of mathematicians to fill positions in industry, government, and research.

Dr. Hanan Rubin, assistant professor of mathematics and chairman of the event, said the purpose is to make qualified high school students aware of the career possibilities in the mathematical sciences through their advisers and mathematics teachers.

The conference was held in the main building of the University's Washington Square Center. The morning session was devoted to a discussion of employment opportunities at various levels and to a brief description of some of the work in which mathematicians are now involved. The participants and representatives of industry were guests at a noonday luncheon. President Carroll V. Newsom of New York University and Dean Harold W. Stoke of the University's Graduate School of Arts and Science, gave the principal talks.

The afternoon session dealt primarily with high-speed electronic computing machines. A tour of the Institute followed. The participants also had an opportunity to observe UNIVAC in operation.

DIAMOND SHAPED TOOL TECHNOLOGY

The nation's first course in the preparation and use of diamonds as industrial tools is being conducted at the Illinois Institute of Technology, Chicago, Ill.

The course, a noncredit evening class, was initiated at the Institute last semester. The second semester just began on February 11.

The one-semester course is part of the educational program on shaped diamond technology established at Illinois Tech by Industrial Distributors, Ltd., of Johannesburg, South Africa. It covers selection of diamonds for various uses, sawing and shaping diamonds for tools, and turning, boring, and wheel dressing.

Twenty persons, most of them toolroom technicians, tool makers and designers, registered for the first semester classes. The course includes three hours of lecture and three hours of laboratory instruction each week for 15 weeks. It meets from 6:20 to 9 p.m., twice weekly.

High school graduation, or its equivalent,

(Continued on next page)

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NEWS NOTES

(Continued from previous page)

and employment in the machine tool industry are prerequisites for registration.

A two-week summer course on diamond shaped tool technology will be held for the first time next June at Illinois Tech. Tool technologists from around the nation are expected to take advantage of this opportunity to get a full course in two weeks of intensified study.

For further information write to: *Dr. Frank D. Carvin, Illinois Institute of Technology, Technology Center, Chicago 16, Ill.*

YOUR OPPORTUNITIES IN INDUSTRY AS A TECHNICIAN

American industry faces a critical shortage of well-trained technicians today and an average of between five and seven of these specialists are reported needed right now for every one professional engineer in all areas of industrial research, development and production.

The Educational Department of the National Association of Manufacturers has just come out with a 32-page educational, aid booklet entitled "Your Opportunities in Industry as a Technician," which emphasizes the vital role and promising futures in this comparatively new and growing occupation.

Citing the enormous range of activities and career opportunities in all fields, the pamphlet notes that the technician holds a key spot between the engineer and craftsman in industry, between theory and production.

The book is profusely illustrated with 15 photographs and contains detailed descriptions of the work and qualifications needed to be a technical specialist in nine specific categories: electric power, diesel, instrumentation, air conditioning, chemical, tool design, aviation, industrial, electronics.

This pamphlet on technical development, keyed especially for junior and senior high school students and for use by guidance counselors and libraries, is a companion piece to a similar educational aid published late last year by the NAM, which is entitled "Your Opportunities in Industry as a Skilled Craftsman."

Both can be obtained by writing to the *Education Department of the National Association of Manufacturers, 2 East 48th St., New York 17, N. Y.*

PRINTING MANAGEMENT ADDED TO CURRICULA

Printing Management will be added to the curricula offered at Western Michigan University in the fall of 1957. A four-year course leading to a bachelor of science degree, Printing Management will provide for specialized study in the areas of printing, business administration, and industrial supervision. The curriculum has been planned after consultation with members of the printing industry and careful study of similar offerings by other institutions.

The objective of the curriculum will be to train for the management and sales side of industry, rather than to train compositors or pressmen for the shop.

Further information about Printing Management may be obtained by addressing *L. J. Brink, Associate Professor of Printing, Western Michigan University, Kalamazoo, Mich.*

VOCATIONAL INSTRUCTIONAL FILMS

Budgets for vocational-instructional films may be stretched farther under a program instituted by the California Vocational Foundation. Through a fund set up to promote the use of how-to-do-it visual aids, two thirds of the purchase price may be refunded.

The foundation is an endowed nonprofit corporation devoted to furthering vocational education. By contributing toward the purchase price the foundation hopes to encourage the use of more visual aids showing specific vocational skills. Films, film strips, and slides will be considered for approval.

Inquiries should be addressed to *California Vocational Foundation, P.O. 8033, Long Beach, Calif.*

EXTENSIVE BUILDING PROGRAM AT STOUT

Dr. Verne C. Fryklund has outlined an extensive building program which Stout State College will undertake during the next few years. Two structures, a $525,000 student union and a $600,000 addition to the recently completed residence hall for women, will be started this summer.

Dr. Fryklund pointed out that the cost of these two buildings will be borne entirely by students attending the college and will not come from tax funds. It is the present policy of the state of Wisconsin to finance student unions and dormitories on a long term basis, obtaining the necessary money from a portion of student fees allocated for such purposes.

However, college buildings entirely of an educational nature, such as classrooms or shops, are still constructed on the basis of state-appropriated funds.

The new student union will be located between Stout's present physical education

(Continued on page 40A)

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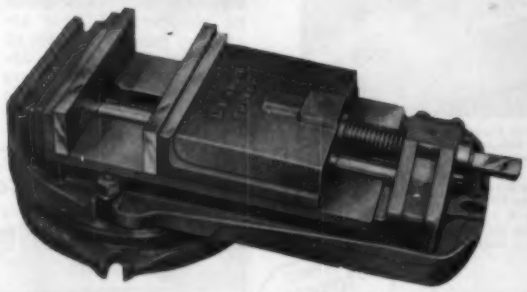

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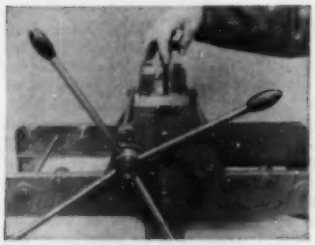

Press Showing Easy Tension Adjustment

Press Showing Etching Roller in Place

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Asphaltum, pint
2 Chinese Pencils
2 Sheets 0000 Emery Polishing Paper
Burnt Plate Oil, pint
4 Tubes ink, ½ lb. each
20 Sheets USA Print Paper, rag white 26" x 19"
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1 Carving Knife
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10 Sheets French Print Paper RIVES 26" x 19"
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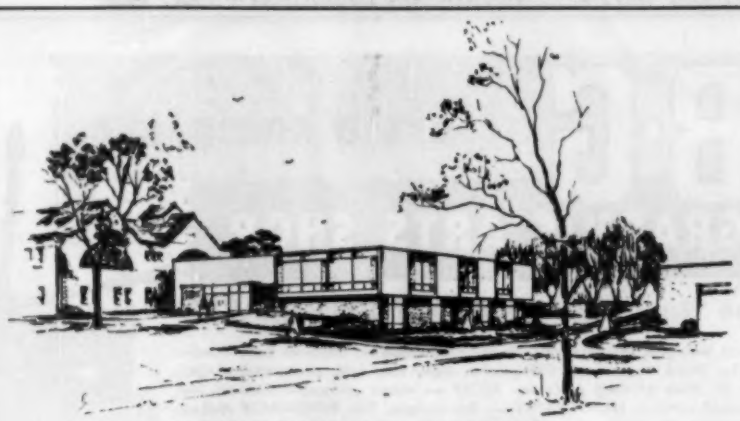
NEWS NOTES

(Continued from page 38A)

building, and the college library. Access to the building will be from three sides, with a service entrance located on the east. Because of the 120 by 100 ft. new union and the requirement of a service entrance, it will be necessary to raze immediately the wooden farm-shop building of the Dunn County Agricultural School.

The union will also occupy the present playground area of Stout's nursery school, necessitating removal this spring of the college-owned Ingram house next to the physical education building. The playground will then be re-located on a portion of the Ingram lot, the remainder of the land being used for a walkway to the union.



Student Union, Stout State College

The exterior of the two-story union building will be of brick and masonry panels, enhanced by the use of much glass and aluminum.

The next building scheduled in the construction program is a $725,000 multi-story metal shop and classroom structure, to be located on the corner where the Dunn County Agricultural high school and Dunn County Teachers College now stand. All metalworking activities will be located in the lower floors. Offices and classrooms for certain academic areas will occupy the upper stories.

ENGINEERING SECRETARIAL COURSES OFFERED

The Business Training College, 14 Wood St., Pittsburgh 22, Pa., offers unique professional classes to provide scientific background for administrative assistants. The charter class is to graduate in June.

The engineering secretarial course is fast proving to be a boon to the busy and harried professional engineer.

The young men and women who have been devoting their attention to engineering secretarial accomplishments will be ready to serve individual engineers, engineering firms, and the professional associations throughout the country. It is the only Engineering Secretarial Course offered in the United States.

It is the purpose of the college to give its students the type of training that will enable them to be of great assistance to the busy engineer who does not have the time to concern himself with details which can be handled by a secretary who understands his language.

The Business Training College, founded in 1933 by Dr. Dorothy C. Finkelhor, has become famous for training professional secretaries in the medical field, and graduates of this course have been very well accepted because they have been given sufficient medical background to cope with the professional terminology involved in medical secretarial assignments. The college planned the engineering course the same way, namely, to give the students a scientific background in addition to the secretarial skills such as shorthand and typing. The background subjects include chemistry, physics, advanced mathematics, and the terminology of the various fields of engineering. In addition, an intensive course in filing and blueprint reading, with the use of the Vari-typer, is provided.

SCHOLARSHIPS OFFERED

A total of 500 scholarships at 14 universities are being offered this year at the 1957 Summer Workshops in Family Finance sponsored by the National Committee for Education in Family Finance.

(Continued on page 42A)

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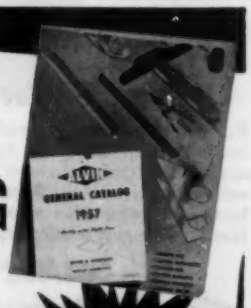

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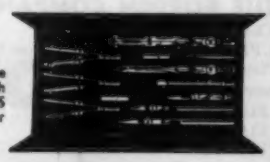

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NEWS NOTES

(Continued from page 40A)

This marks the eighth consecutive year in which the workshops are being offered. The Committee's objective is to encourage adequate instruction in the fundamentals of sound personal and family financial management for high school and college students.

The workshop scholarships are open to educators who demonstrate a need and use for information and teaching materials in family finance: classroom teachers in schools, colleges, and teacher-training institutions, as well as administrators, supervisors, and curriculum directors. Credit toward a graduate degree is awarded upon successful completion of the course.

Each university is also offering a limited number of team scholarships for individual school systems.

Application blanks and descriptive brochures may be obtained by writing to the headquarters of the *National Committee for Education in Family Finance, 488 Madison Ave., New York 22, N. Y.*

SHELL FELLOWSHIP PROGRAM

The expanded 1957 Shell Merit Fellowship program for high school science and mathematics instructors, sponsored by Shell Companies Foundation, are designed to provide recognition and specialized help to deserving high school teachers. The full summer term seminars will include basic and advanced courses in chemistry, physics, mathematics, and education, as well as field trips to research and industrial facilities, and informal conferences with outstanding scientists and mathematicians.

The program has been expanded this year to include 90 teachers of physics, chemistry, and mathematics from the United States and Canada. The Merit Fellowship program, developed along recommendations of leading scientists and educators, was inaugurated last year with 60 fellowships.

The Fellowships include tuition fees, living expenses, a travel allowance, and $500 in cash to offset loss of potential summer earnings. Dr. Philip G. Johnson is co-ordinator of the program at Cornell, and Dr. Paul DeH. Hurd serves as co-ordinator at Stanford. All requests for information on the Shell Merit Fellowships should be directed to them.

HOW FLUID POWER SERVES INDUSTRY

The National Fluid Power Association, 1618 Orrington Ave., Evanston, Ill., have made available a brochure describing the workings of a vital industry. It is entitled "How Fluid Power Serves Industry," and is intended to attract both public understanding and also the vocational interest of students able to prepare for either maintenance work or engineering techniques.

Copies can be obtained without cost or obligation, by request, on a school or business letterhead.

MECHANICAL DRAWING HANDBOOK

A Junior High School Handbook for mechanical drawing, sketching, and blueprint reading has been published by the Minneapolis Public Schools.

A committee of four drafting teachers and the director of vocational education worked on this handbook for the last three years.

Members of the Committee are: chairman — Harold Tietz, Minneapolis Vocational High School; Robert Means, Byrant Junior High School; Joe Horkey, Nokomis Junior

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6) MASONRY SIMPLIFIED, VOL. I
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Dalzell-Townsend
(Second Edition).....$5.40

7) MASONRY SIMPLIFIED, VOL. II
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8) CABINETMAKING AND MILLWORK: Dahl-Wilson
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High School; Ed Carlson, Franklin Junior High School; and John Robohm, director of vocational education (now retired).

THE CHEMICAL INDUSTRY FACTS BOOK

The third edition of "The Chemical Industry Facts Book" was published recently by the Manufacturing Chemists' Association.

The 160-page basic reference work on the chemical industry contains 15 chapters ranging from "The Industry's Role in the Economy" to such specifics as "Chemicals and Nuclear Energy."

Profusely illustrated with charts, graphs, and tables, the third edition of the Facts Book updates information on virtually every facet of the industry. Past editions have proved to be valuable aids to editors, educators, analysts, and others requiring detailed accurate information about the chemical industry. It is anticipated that one of the principal uses of the Facts Book will be in schools and colleges as a supplementary text and reference work. A 20-page Teacher's Guide prepared by Dr. John S. Richardson, president, National Science Teachers Association, is available free to educators for use with the Facts Book.

Single copies, $1.25. Discounts available on quantities.

♦ A week's short course to give mortgage lenders an understanding of the home-building industry and the processes of building will be conducted July 8 to 13, 1957, by the University of Illinois Small Homes Council on the Urbana-Champaign campus.

Registration, being staged in co-operation with the Division of University Extension, is open to all persons engaged in home financing and appraising.

All lectures and demonstrations on technical subjects will be presented by University of Illinois faculty members. Field trips to research houses and houses under construction are scheduled.

Information regarding registration can be secured from the *Supervisor of Engineering Extension, Room 116, Illini Hall, 725 S. Wright St., Champaign, Ill.*

♦ An in-service teacher training program was started at the Mankato Vocational School, Mankato, Minn., on Thursday, January 31, 1957. This course is being conducted by the University of Minnesota, and members of the instructional staff include Dr. Micheels, Professor Widdowson, and Dr. Nelson. The course is offered as a service for both day and evening school teachers.

New Publications

Practical Woodworking Projects for Today

By Frank Miller Clemons. Cloth, 93 pp., 6 7/16 by 9 1/8 in., illus., $2.50. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

A very interesting book presenting 35 simple contemporary projects that are not too difficult for the student or the homecraftsman.

Among the projects, all of which are accompanied by clear descriptions, fine line etchings and halftones, are 9 different table lamps, a carved serving tray, 3 television lamps, 2 clocks, 2 magazine stands, 2 magazine tables, an end table, 3 coffee tables, a dressing stool, record cabinet, desk, carved book ends, modern corner shelf, end-table combination, bedside table, bookcase, and day bed.

(Continued on next page)

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NEW PUBLICATIONS

(Continued from previous page)

Repairing Television Receivers

By Cyrus Glickstein. Paper, 212 pp., 5½ by 8½ in., illus., $4.40. John F. Rider Publisher, Inc., New York, N. Y.

This is a modern practical book on TV troubleshooting and repair techniques. It presents a step-by-step procedure on how to diagnose and troubleshoot a faulty TV receiver, and explains how to localize defective sections, then defective stage, and, finally, the defective component. A down-to-earth approach to successful TV servicing covering use of test equipment, both simple and complex, with numerous practical illustrations showing troubleshooting test setups.

Contemporary Metal Home Furnishings

By Donald G. Lux and Edward R. Towers. Cloth, 185 pp., 7 by 10½ in., illus., $3.50. McKnight & McKnight, Bloomington, Ill.

This interesting book presents the reader with 58 contemporary designs of pleasing appearance all of which use comparatively little material and can be made with but little special equipment and but a modicum of skill. Each project is accompanied by a line drawing and a halftone to show how the finished object is to look.

The nine chapters present the material under the following titles: metal home furnishings in modern living, how to design and plan the project, materials, cutting, drilling, bending, oxyacetylene welding, finishing, how to proceed, and 58 fine projects.

How to Take Better Home Movies

By Peter Gowland. Cloth, 144 pp., 6¼ by 9¾ in., illus., $2. Arco Publishing Co., New York, N. Y.

The author of this instructive book, himself a well-known photographer of movie actors and actresses, gives expert advice to amateurs on operating the movie camera, their lenses and accessories, films and filters, outdoor lighting, composition, the moving camera, trick photography, artificial light, underwater movies, editing, titles for the pictures, projection, sound with the pictures, and markets for movies.

Procedure Handbook of Arc Welding Design & Practice

This is the eleventh edition prepared by The Lincoln Electric Co., Cleveland, Ohio. The first edition of this book on arc-welding appeared in 1933.

It contains full information on arc welding for the machine designer, for the structural engineer, the architect, the fabricator, welder, structural engineer, contractor, student, supervisor, inspector, and metallurgist.

The book contains 8 parts, which present the history of welding; techniques, procedure, speeds, and costs of welding steel; weldability of metals; design and production data; arc welding construction of machines; designing of arc welding structures; and reference data.

Foundations of Radio

By M. G. Scroggie. Cloth, 349 pp., 5⅜ by 8⅝ in., illus., $10. Philosophical Library, New York, N. Y.

This is a new and completely revised and enlarged edition of the basic theory of radio.

The book contains 250 diagrams, and the introduction explains the use of algebraic symbols, graphs, and circuit diagrams.

The 22 chapters present clear explanations of sound waves, electrical notions, capacitance, inductance, alternating currents, inductance in a.c. circuits, tuned circuits, valves (tubes), oscillation, the sender, radiation and aerials, detection, single-tube receivers, radio-frequency amplification, selectivity, superhetrodyne receiver, audio-frequency circuits, power supplies, cathode-ray tubes, transmission lines, and semiconductors.

The appendix contains alternative technical terms, symbols and abbreviations, circuit symbols, and a decibel table.

How to Install & Service Intercommunication Systems

By Jack Darr. Paper, 152 pp., 5½ by 8½ in., illus., $3. John F. Rider Publisher, Inc., New York, N. Y.

This book covers the entire field of "intercom" systems' work in sufficient detail to enable the reader to do installation and maintenance work on this type of electronic equipment. It discusses basic amplifiers, special speakers, switching arrangements, a.c. and a.c./d.c. systems, wireless systems, cabling networks, all call systems, paging systems, remote and master systems, one- and two-way intercom systems, installation for home and industrial use, outdoor wiring, and system requirements for particular application.

(Continued on page 46A)

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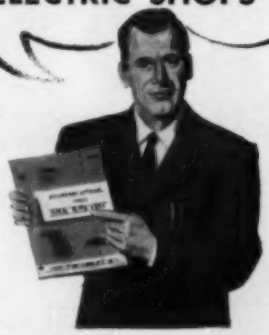

You should have Publication No. 244 . . . *especially* if you are planning a new shop or re-vamping your present one. This booklet gives valuable suggestions; offers a shop layout plan and lists fundamental requirements.

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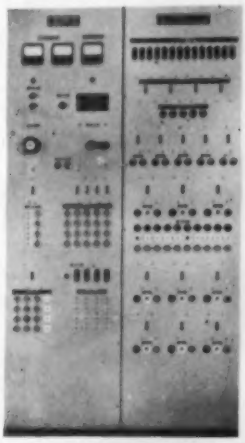

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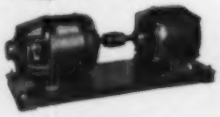

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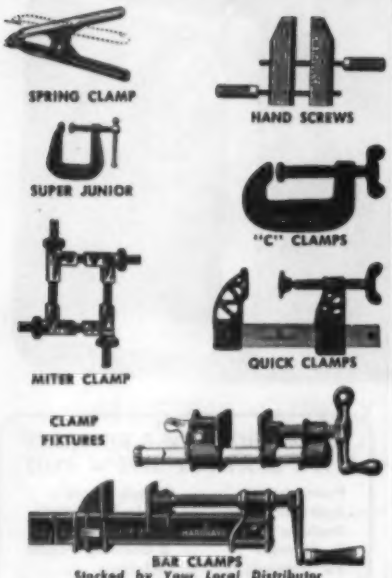

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The Oven is controlled by a newly developed thermostatic control, sealed in and conveniently placed on the front panel, of the Oven. It can accurately be set at any desired temperature where a quick rate of heat up to 306° F. is desired.

Due to the Aluminum Construction, the Oven is very light in weight and can be carried from the room or project to project. As it operates on 110 volt AC or DC, it can be plugged into any 110 volt receptacle.

No. 600

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NEW PUBLICATIONS

(Continued from page 44A)

Most-Often-Needed 1957 Radio Diagrams and Servicing Information

Compiled by M. N. Beitman. Paper, 192 pp., 8⅜ by 10⅝ in., illus., $2.50. Supreme Publications, Highland Park, Ill.

This book will assist the serviceman to make quick repairs on all new 1957 and older radios. It contains diagrams for all of the various makes of radios.

L-C Oscillators

By Dr. Alexander Schure. Paper, 72 pp., 5½ by 8½ in., illus., $1.25. John F. Rider Publisher, Inc., New York, N. Y.

This book is Volume 13 in the Electronic Technology Series. It deals with L-C oscillator elements, energy conversion, frequency range and stability, power considerations, oscillator efficiency, harmonic generation, series and parallel resonance, and critical damping. L-C oscillators are widely used in all varieties of radio communication systems, industrial electronic devices for control and manufacture.

The Presentation of Technical Information

By Reginald O. Kapp. Cloth, 147 pp., 4⅞ by 7½ in., $1.95. The Macmillan Co., New York, N. Y.

This book is based on lectures given by the author at the University of London in which he attempted to assist engineers and scientists acquire the art of conveying to others the technical information which they possess.

The book lucidly presents the subject in chapters under the names of functional English, functional compared with imaginative literature, the problems of functional English, choice of material, the work done by the person addressed, the proper pace, what it is about, making it easy to understand, making it easy to remember, circumlocutions, generalizations, meaning what you say, qualifications, metaphors, and words.

Rutherford, Atom Pioneer

By John Rowland. Cloth, 160 pp., 5 by 7½ in., $4.75. Philosophical Library, New York, N. Y.

This is an interesting biography of an atom pioneer. Ernest Rutherford, a man of great energy, was born in New Zealand and held important scientific posts in Canada and Great Britain.

His early research was on Hertzian Waves which are basic to radio and television. He invented a wireless detector and also worked on underwater detectors used in World War I.

His real bid for greatness, however, rests on his research in atomic physics which made possible the development of the atomic bomb, the building of power stations, and the use of atomic energy for industrial purposes.

Operative Remodeling

A work of the Publications Department, United States Gypsum Company, 300 West Adams St., Chicago 6, Ill., with the co-operation of the National Association of Home Builders. Cloth, 126 pp., 7⅝ by 10¾ in., illus.

A helpful book for builders and "do-it-yourself" and home workers who are confronted with the important task of prolonging the life of older homes.

The book contains many pictures and its contents cover nine chapters under the following titles: why should a builder tackle operative remodeling; the first key to remodeling profits; organizing for remodeling; aid for the

(Continued on page 48A)

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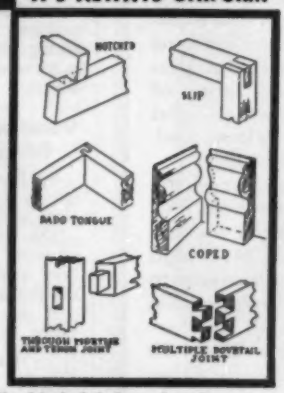

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Small D-C Portables (Model 489)

Widely used for classroom instruction where accuracy of 2% full scale suffices. Available as Ammeters, Milliammeters, and double and triple range Voltmeters. Extremely compact, with rugged black Bakelite cases. Low cost.

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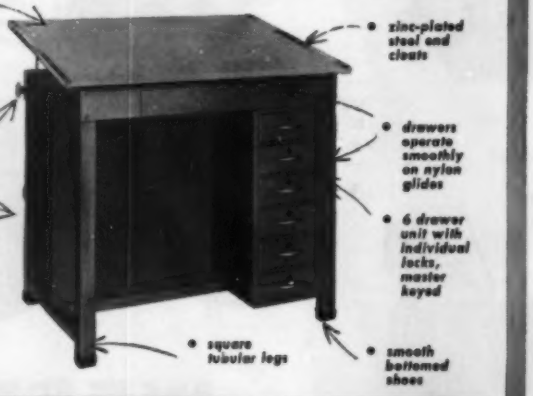
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NEW PUBLICATIONS

(Continued from page 46A)

buyer of remodeling property; an estimator of remodeling needs; aid for the designer of remodeling projects; guide to construction problems in remodeling; guide for heating, wiring, and plumbing problems in remodeling; and merchandising and selling remodeled houses.

Vocational and Practical Arts Education

By Prof. Roy W. Roberts. Cloth, 637 pp., 6¾ by 9½ in., illus., $6. Harper & Brothers, New York, N. Y.

This voluminous text presents an excellent overview of the history, principles, and practices used in the preparation of workers in the many fields of vocational education.

It describes the origins of vocational education and the development of practical arts, the federal aid given to these schools. It also sets forth how the program of vocational education is administered by Washington and by the state boards of vocational education.

Vocational programs of agricultural education, distributive education, homemaking education, industrial education, vocational education in industry, vocational rehabilitation, and industrial arts are all clearly described, as are also the public laws for vocational education, such as the Smith-Hughes Act, George-Reed Act, the George-Ellzey Act, George-Deen Act, George-Barden Act, and the vocational education acts for Hawaii and Puerto Rico.

Business English and Handbook of Grammar and Usage

By J. Harold Janis, Edward J. Kilduff, and Howard R. Dressner. Paper, 332 pp., 5⅛ by 8⅛ in., $1.75. Barnes & Noble, Inc., New York, N. Y.

This is one of the college outline series published by this firm of publishers.

Part 1 of the book is on business English pertaining to letter writing while Part 2 treats of grammatical rules, etc.

The appendix contains 50 examination questions pertaining to Part 1.

On November 4, 1791, Gen. Arthur St. Clair's troops, sent by Washington to build a chain of forts and secure western Ohio country, were surprised by Indians while camped along the Wabash. Of the 1400 troops encamped, more than 600 were killed, and only 500 escaped unhurt. — *Wisconsin Military District.*

Business and Personal News

BORDEN COMPANY CENTENNIAL

The Borden Company celebrates its 100th birthday this year. From one item, condensed milk, in 1857, the number of Borden products in the past century has grown to more than 800. The "Main Line" items — some of them in the Borden family by birth, some by adoption — as firms joined the company over

the years, embrace the manufacture of cheese, chemicals, fluid milk, ice cream, food, and special products.

In its time the Borden Company has witnessed prosperity and panics, depressions and wars, and has undergone many changes as times and customs changed. As it stands on the threshold of its second century, the company can look back to the day when it had but three owners. Now it has almost 48,500 stockholders. A hundred years ago, it had ten employees; today, there are more than 34,000. The company has grown from one plant to more than 700 business locations, including several hundred plants and many more hundred branches and sales offices.

Out of its 100 years of experience, the Borden Company is preparing itself for the century ahead. It will use its centennial as the occasion for looking back, and moving forward.

ROBERT J. FISHER PROMOTED

Promotion of Robert J. Fisher to the position of advertising and sales promotion manager of Mercury Division, was announced recently by George S. Coats, general marketing manager of the Mercury Division of Ford Motor Company.

Since 1954 Mr. Fisher has served as advertising manager for Mercury. He succeeds T. J. Henry who is returning to advertising agency work.

Born in Ashland, Ohio, Mr. Fisher was graduated from Classical High School in Springfield, Mass., and received his A.B. degree from Syracuse University, graduating magna cum laude. He is a member of Phi Beta Kappa.

SALES OFFICE IN DALLAS, TEX.

Cadillac Plastic & Chemical Company announces the opening of a sales office at 500 Santa Fe Building, Dallas, Tex., to serve plastic users in the southwestern states.

The new office will serve school buyers in the Texas, Louisiana, Oklahoma, New Mexico area.

Ernie Dourlet has been appointed sales representative in charge of the new office.

The Dallas sales office is Cadillac Plastic's eighth. The other branches and warehouses are in Chicago, Cleveland, St. Louis, Milwaukee, Los Angeles, and San Francisco. The home office is 15111 Second Ave., Detroit 3, Mich.

When about to fall on icy ground, a person usually tries desperately *not* to fall. The National Safety Council says the body and limbs should be relaxed. Instead of stiffening in an effort to avoid the fall, the body should be relaxed and allowed to slump in the direction of the fall. — *Facts About Falls.*

Descriptive Material

STANLEY EARLY AMERICAN DESIGNS

Stanley Tools, division of The Stanley Works, are offering a new series of 15 Early American Designs, Series D.

Drawings of each of the designs, which include a cranberry scoop plant holder, spice cabinet, corner shelves, miniature dough trough, and other projects, are printed on a separate 8½ by 11-in. page. Projects have been selected and drawn to scale by an expert.

(Continued on next page)

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THIS BOOK IS YOUR IDEAL TEACHING GUIDE FOR EFFECTIVE COLOR TV TRAINING

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This comprehensive training course, written by Oliphant and Ray, clearly covers the entire subject of Color TV. Contents: **SECTION I:** Principles of the Color TV System (includes chapters on Colorimetry; Requirements of the Composite Signal; Make-up of the Color Picture Signal). **SECTION II:** Color Receiver Circuits (chapters on RF and IF Circuits; Video, Sync and Voltage Supply Circuits; Bandpass-Amplifier, Color-Sync and Color-Killer Circuits; Color Demodulation; Matrix and Output Circuits). **SECTION III:** Servicing the Color Receiver (chapters on Setting Up the Color Picture Tube; Aligning the Color Receiver; Trouble-Shooting; Test Equipment Required). Appendices include Equations, Vectors, Color-blocks, Colorplates, Glossary. A well-organized, effectively presented training course for advanced students in Electronics. 260 pages, 8½ x 11"; profusely illustrated. Order **TVC-1**, only..... **$6.95**

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"BASIC RADIO MANUAL." The widely used Training Course in Radio. Includes 36-Lesson Section covering basic radio theory, terms, circuits and symbols, components, test instruments, radio transmitting and receiving principles, etc. The 13-Project Section demonstrates theory in practical action by actual doing; includes construction projects, application of basic laws, soldering practice, construction, etc. Adopted as standard text by hundreds of schools. 248 pages; fully illustrated. 8½ x 11". **$5.00**
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"BASIC ELECTRICITY MANUAL." This outstanding training course consists of 35 Lessons in Practical Electricity, covering basic theory, laws, terms, magnetism, motors, transformers, lighting, telephones and dozens of other subjects. Includes 13-Projects Section, outlining simple, inexpensive projects which demonstrate theory in practical action and which teach interestingly through actual doing. 264 pages; profusely illustrated; 8½ x 11". **$5.00**
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Accurate, detailed, measured drawings, 38 museum masterpieces made by America's famous cabinetmakers. $4.95

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Plans and instructions for making 116 garden projects including outdoor picnic tables, benches, trellis. $2.95

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Over 700 photos and drawings show approved woodworking methods. A step-by-step guide to machine operations. $2.95

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Every kind of table you need. Selected professional designs. 35 styles to choose from. Plus 10 chairs, plain and upholstered types. 8 home desks including student, antique and modern. 4 settees, settles and seats. Over 300 detailed drawings. Clear instructions for making every piece. 235 specially-made photos guide you from start to finish. $3.95

How to Build Your Own WORKSHOP EQUIPMENT
How to make 171 practical, little-known bench aids, clamping devices, storage racks, shop equipment. $3.95

Selected WOOD TURNING PROJECTS
Over 70 useful, decorative trays, bowls, tables, lamps, inlaid turnings. Also 30 best period turning profiles. $3.95

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Practical, professional designs, plans, details for built-ins, room dividers, closets, chests, wardrobes, music centers, bathroom counters, cabinets, new eye-level ovens. Also a complete chart of size standards of household items — the help you need to teach or build practical built-ins. $3.95

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. . . for Amateurs and Professionals
Brand-new book by Whitney K. Towers, woodworking consultant to cabinet shops, aircraft, etc. Complete, practical, detailed. Latest facts about woods, reading & making shop dwgs., laying out work, joinery, gluing, clamping, restoring, finishing. All about cabinetmaker's tools, hand & power, materials, professional tricks & methods. Cabinetmaking as high-pay trade. Running a profitable cabinetmaking business, etc. Over 40 quick-reference charts & tables. 1,000 illus. Essential reference book for wood shop instructors. $6.95

HOME CRAFTSMAN Publishing Corp.
115 Worth St. • New York 13, N. Y.
Publishers of Home Craftsman Magazine

DESCRIPTIVE MATERIAL

(Continued from previous page)

This is the fourth set in Stanley's series of "Early American Designs," the others being "A," "B," and "C."

(For Convenience Circle Index Code 0516)

KODAK FILMS IN TWO-CARTON PACKS

There is added convenience for the amateur photographer in the compact new two-carton pack now being used for three of the favorite Kodak films — Verichrome Pan, Panatomic-X, and Tri-X in the 127, 120, and 620 sizes.

Eastman Kodak Films in the Two-Roll Carton

A simple twist separates the two individual cartons joined by concealed, nondefacing tape. While the amateur snapshooter may buy both cartons of film, or only one if he prefers, the new duoble packaging is planned to serve as a reminder to buy that extra roll of film which is always so handy to have.

The two-carton pack or a separated individual roll will fit easily into pocket, purse, or gadget bag.

The roll films are available at Kodak dealers with no change in costs from the combined individual roll prices.

(For Convenience Circle Index Code 0517)

NEW DI-ACRO PROJECT PACKET

O'Neil-Irwin Manufacturing Company have made available to shop instructors and supervisors without charge, a selection of six projects presented in packet form. This packet includes plans for a portable barbecue, coffee table with glass top, combination end table and magazine rack, gossip bench, lawn chair, and upholstered snack bar stool. All projects are designed with an eye toward encouraging students to use them as idea sheets in designing projects of their own.

Other up-to-date projects on metal and plastics are also available upon request.

(For Convenience Circle Index Code 0518)

THE 1957 B-G CATALOG

The Brodhead-Garrett Company makes the proud boast of serving the school shops of America for 50 years. They have again made available their annual catalog which contains practically everything that the industrial arts and vocational school shops need.

This useful catalog lists all the hand and power tools, as well as the materials and supplies needed in the industrial arts, general shops, vocational shops for teaching automotives, block printing, ceramics, drafting, electricity, foundry, graphic arts, leatherwork,

(Continued on page 52A)

HERE ARE SOME OF THE NEW THINGS YOUR STUDENTS CAN MAKE WITH THESE AMAZING NEW PLASTICS!

For Example...PLASTIC PLANTS

They're Easy to Make — Lots of Fun, too, with VINOFLEX

the Remarkable New Liquid Vinyl Plastic that Produces Foliage so *Realistic and Life-Like*, its Hard to Tell it From Live, Growing Leaves when Viewed from Just a Few Feet Away!

Now — your students can make a wide variety of authentic-looking evergreen plants for decorating windows and planter boxes with the same material used to make dolls that look and feel so real. Vinoflex, newest marvel of the plastics world, is a syrup-like liquid that pours easily and forms a tough, resilient, rubbery material when exposed to oven heat from 300 to 325 deg. F. One of the unique features is that it can be used to make *internal* or *external* reproductions of a mold. Molds can be made of metal, glass, plaster — anything that withstands 325 degrees for a few minutes. Vinoflex foliages are Fireproof. Washable, Fade-Resistant, Droopless — can be cleansed with a damp cloth. Available in white, opaque, clear, light or dark green, red and yellow. Vinoflex comes in 8-oz., pint, quart and gallon sizes. It's ideal for making an endless variety of toys and novelties, too!

Plastic Plants (and Real Ones, too) Need a

PLASTIC GREENHOUSE!

Build Your Own with Polyethylene & Vinyl Film

We have them 0.002" and thicker. In rolls up to 6 ft. wide. Also make a perfect moisture barrier and mulch on strawberry plant beds.

Projects in

FIBERGLAS-POLYESTER AND EPOXY RESINS

give a Lift to Any Course in Plastics!

Repair and Restyle Auto Bodies and Fenders, Build Boats, Work Bench Tops, Awnings, Furniture, etc.

Send for FREE literature giving complete buying information on *everything* you need in Fiberglas-Plastic for the school shop. It describes in detail Glass Cloth, Resins, Extenders, Catalysts, Solvents, "How-To" Books, etc. Also includes sample of this remarkable material for your inspection.

SPECIAL OFFER!

Beginner's Kit

Our "COVER-IT KIT" contains the right amount of material for the beginner student, or to experiment with yourself. Let's you see how easy it is to repair boats, toys, lamps, furniture, etc. Complete Kit.....$3.95 (plus 50c postage)

White Polyethylene Rope

If floats! Produced by the twisted-spun-laid method. It's attractive, long lasting, lightweight, dimensionally stable. Completely waterproof and buoyant. 30% lighter than natural fibre rope. Has extremely high resistance to virtually all types of acids and solvents, salt water, alcohol. It is unaffected by mold, bacteria, rot, fungi. Has excellent weathering characteristics. Does not deteriorate with age. Available in 3/16" to 3/4" dia. Ideal for water ski tow lines, lane markers for swimming pools, heaving lines and other life-saving equipment, functional and decorative applications.

Send for Our Price List!
America's Most Complete and Up-to-Date Line of Plastics!

It gives helpful buying data on Plexiglas, Acetate, Castolite, Molding Powders and Presses, Cold Setting and Hot Melt Castings Resins. Screw Driver Handle Stock, Finishing Compounds, and others. Don't delay — write today!

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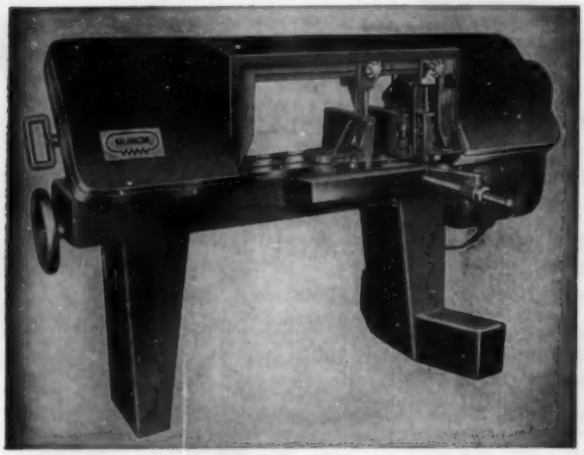

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METAL CUTTING BAND SAW

MODEL 8C
CUTS 8" ROUND, 16" FLAT STOCK, 8" PIPE

Good tools make teaching good workmanship easier. That's why most leading schools use *Kalamazoo* Metal Cutting Band Saws. Specify *Kalamazoo* for accuracy and safety. Four models, available with casters and coolant. Get full details *now*.

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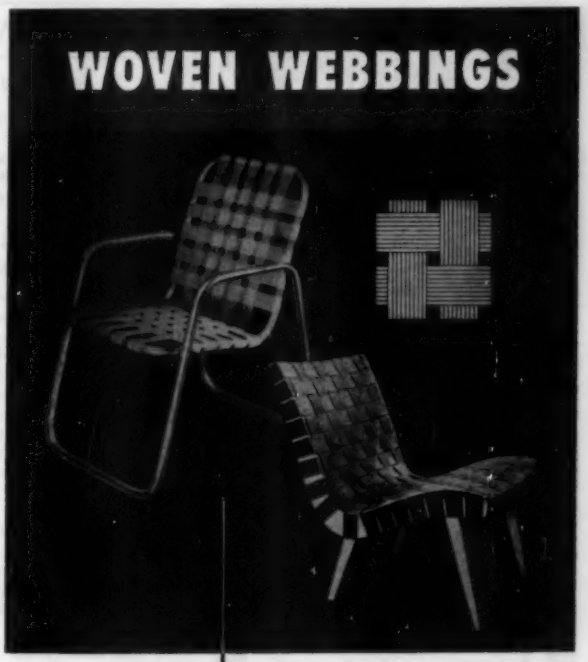
WOVEN WEBBINGS



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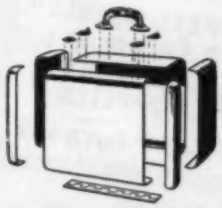

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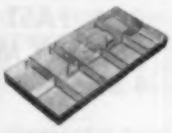
SCHWEIZER ALUMINUM CONSTRUCTION KITS

PRACTICAL—USEFUL—ECONOMICAL—EDUCATIONAL END PRODUCTS

Utility Case Kit #1A Size—17" x 8" x 8"



Multipurpose Tray Kit #3 Size, Fits 17" x 8" Utility Case

Captain's Case Kit #4 Size 13½" x 12" x 5½"

SCHWEIZER AIRCRAFT CORP.
EDUCATIONAL DIV., ELMIRA, N. Y.

FILL IN THIS COUPON—TEAR OFF—MAIL TODAY

Gentlemen: Send me the following: ——Utility Case Kit(s) #1A @ $4.25 ea. ——Multipurpose Tray Kit(s) #3 @ $1.95 ea. ——Captain's Case Kit(s) #4 @ $4.25 ea. ——Special 3-Kit Unit @ $10.45 ea.

With each special 3-kit purchase 1 lb. of Plexiglass will be included FREE! (This offer expires midnight Dec. 1, 1957)

☐ Check for amount enclosed ☐ Bill the school, Purchase Order#———

All prices F.O.B. Elmira, N.Y. Weights: Captain's Case—4 lbs.; Utility Case—5 lbs.; Tray Kit—2 lbs.

Name ..... Title .....

Name of School .....

Address ..... City ..... Zone ..... State .....

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Modern Wood Finishing
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Brushes can be stored in the Protexem Brush Conditioner without cleaning. Brushes are always in perfect working condition help to improve the work in the paint shop. Brushes that have been carelessly mislaid can be restored to full service by merely storing the brush in the Protexem Brush Conditioner.

Protexem is a VAPOR ACTION Brush Conditioner. Because vapor dissolves paint and other finishing materials more quickly than liquids, the brushes are always ready to use. Brushes remain soft and pliable while they are stored in a Protexem VAPOR ACTION Brush Conditioner.

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on paint brush care and full information on the Protexem Paint Brush Conditioner.

WISCONSIN LABORATORIES, Inc.
Dept. IA Dousman, Wisconsin

DESCRIPTIVE MATERIAL

(Continued from page 50A)

pottery and ceramics, plastics, sheet-metal work, and welding.

Arts and crafts and fine arts equipment, materials and supplies also are listed.

(For Convenience Circle Index Code 0519)

PAPER DRILL ACCESSORIES CATALOG

The Challenge Machinery Company announce their new, handy catalog and selector guide on paper drill accessories entitled "Getting the Most out of Your Paper Drill."

Designed to provide paper drill owners with complete information on all the available accessories for Challenge Paper Drills, the new booklet contains extensive information, including prices, on all standard sizes and types of hollow drills, drill sharpeners, cornering, slitting, and slotting attachments for Challenge Drills.

Of special interest is the new information on such accessories as fixed gauges which permit the fast, easy, and accurate duplication of hole settings. Copies of these booklets are available by writing to The Challenge Machinery Company.

(For Convenience Circle Index Code 0520)

SAMS INTRODUCES LATEST PUBLICATIONS

Howard W. Sams & Co., Inc., have announced their new Photofact publication, "Audio Amplifiers and Associated Equipment," Catalog No. AA-8.

Volume Eight contains complete data on 15 amplifiers, 10 preamplifiers, and 12 custom tuners. All of this equipment was produced during late 1955 and early 1956.

Besides being invaluable to the technician who services audio equipment, the technical data presented in the Sams Audio Amplifier Service Manual is of extreme interest to the Hi-Fi enthusiast, experimenter, and hobbyist who desires complete information on audio equipment.

Priced at $3.95, the book contains 240 pages, and is sold through electronics parts distributors.

Another book announced recently is "Low Power Telecasting," Catalog No. OH-2, by Harold E. Ennes.

Although the book presents the basic considerations of planning in the field of low-power telecasting, its contents are pertinent to all engineers whether concerned with low, medium, or high-power telecasting.

It contains 112 pages, and is priced at $2.95. It is available through electronics parts suppliers and bookstores.

A new Auto Radio Removal Manual, the first volume of a new series of manuals, has been announced. This series will cover step-by-step instructions for the removal of radios, power supply units and speakers from automobiles. This initial volume covers 1955 models of American cars.

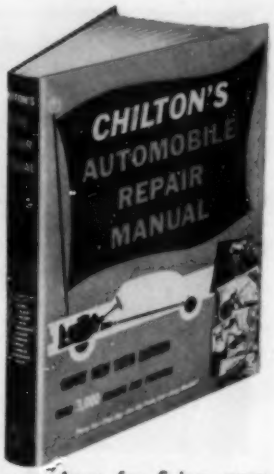
For every auto covered, there is given a list of the tools required; a phantom view of the dash panel with the radio in place which enables the technician to easily and quickly locate chassis mounting nuts or bolts, cables, antenna lead, and speaker leads; and a photo of the radio actually being removed.

"Auto Radio Removal — 1955" contains 104 pages and utilizes a plastic comb binding. The book sells at $2.95, and carries Catalog No. ARR-55. It is sold through electronics parts distributors.

(For Convenience Circle Index Code 0521)

The original still tops Chilton's 1957 AUTO REPAIR MANUAL

3000 pictures
1000 pages
5½ pounds of facts



Step by step procedures for fixing every part of every model from 1946 to 1957! Over 3,000,000 users in the 48 states and Army-Navy training schools. 28th Editon.

FREE BONUS BOOK
Free with every copy of the Auto Manual goes a $1.00 copy of CHILTON'S AUTOMOTIVE SHOP KINKS jammed with short cuts to service problems. It will show you how to save hundreds of repair dollars.

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Six No. 5, Type A Bunsen Burners give this versatile furnace a 400° to 1800° F. range. Temperatures easily controlled. Ratchet-operated door opens upwards. Use with natural, artificial, mixed or bottled gas. Economical and efficient with all. Firebox 7" by 13" by 16½". 78,000 BTU's per hr. (natural gas).

NO. 706 PEDESTAL $312.00
BENCH MODEL ..$287.00

NO. 654 — smaller version, 4 burners, 5" by 7¼" by 13½" firebox —
PEDESTAL $174.00
BENCH MODEL ...$149.00
(All prices F.O.B. Factory)

WRITE FOR FREE JOHNSON CATALOG plus information on factory reconditioning your present Johnson Furnaces.

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THE PENNSYLVANIA STATE UNIVERSITY
University Park, Pennsylvania

Shop Equipment News

DELTA 14-INCH DRILL PRESS

Rockwell Manufacturing Company Delta Power Tool Division have introduced a versatile new low-cost 14-in. drill press designed especially for school shops with limited budgets.

Delta 14-Inch Drill Press

The new drill press offers a streamlined full-length belt guard hinged at the rear and counterbalanced, enabling the guard to be swung up out of the way and suspended in that position automatically like the lid of a car trunk, facilitating cleaning and belt changing and improving over-all appearance.

It offers also a pivoting motor mounting plate permitting quick belt tension release to facilitate speed changes. This lengthens belt life by eliminating forcing and stretching. After a speed change, a spring-loaded plunger automatically restores correct operating tension to the belt. The plunger is milled with reverse taper to maintain uniform belt tension by simply tightening a thumb screw.

In addition to many other new features, it includes balanced pulleys, self-aligning floating drive (a Delta exclusive) and interchangeable spindles.

For further information write to the manufacturer.

(For Convenience Circle Index Code 0501)

STANLEY ORBITAL SANDER AND BELT SANDER

Stanley Electric Tools, division of The Stanley Works, have added two new sanders of orbital and belt design. Incorporating the most advanced engineering developments, the sanders will find wide application with carpenters, painters, cabinetmakers, patternmakers, boatbuilders, and home craftsmen who work with wood, metal, and plastics.

Both the orbital and belt sanders feature maximum operating efficiency because of their Stanley-built air cooled motors, ball bearing construction, vertically positioned "out-of-the-way" cords and perfect balance.

The Stanley H36 orbital sander is a heavy duty tool weighing 6½ lb., and is 11⅜ in. long, 3¾ in. wide, and 6⅜ in. high. Having a pad size of 7 1/16 by 3⅝ in., the sander makes 4500 orbits per minute. Orbit size is 3/16 in.

Also designed for flush sanding, this orbital sander can operate efficiently in restricted work areas. It has two handles, a knob-type in front and a comfortable, tapered lever-type handle which has a slide switch for finger-tip control of sanding action. The auxiliary knob-type handle can be removed when sanding close to perpendiculars.

Stanley Orbital Sander

Stanley Belt Sander

Stanley's 3-in. heavy duty H31 belt sander has power and ventilating systems designed for maximum sanding power with continuously cool operation. The new sander weighs 15 lb., and is 13½ in. long, 6 in. wide, and 7½ in. high. Belt size is 3 by 24 in. Idle speed of sander is 1600 sanding feet per minute.

A "D" grip handle with trigger activator combines with a forward "T" shaped handle to give an operator perfect control of sanding operation. By a simple turn of a knob, a special tracking adjustment aligns the belt perfectly every time. The abrasive belt cannot cut into the housing of the sander since a protective carbide strip has been permanently set into the casting.

For further information on these sanders write to the manufacturer.

(For Convenience Circle Index Code 0502)

NEW HERCULES SWIF

Hercules Chemical Co. Inc., have developed a time and effort saving solder, SWIF, a real 50-50 tin-lead paste solder with flux, which cleans, tins, and solders in one operation. SWIF comes in two formulae; one contains acid flux for general work and the other (EE Grade) contains noncorrosive flux for electrical work. With SWIF the solder is applied *before* heating, offering a definite safety advantage. This frees the hand which ordinarily applies the solder during heating and allows the worker to devote his full attention to the heating. This should be of particular interest to shop and handicraft teachers of

Swif Solder with Flux in Paste Form

anything from metalwork to electronics, since SWIF speeds the job and can be used with comparative ease.

One of the big advantages of SWIF is that the heat of a match is sufficient to solder wires and thin metal. SWIF makes any kind of soldering job easier. It is available either in regular or EE grade in several sizes up to 3 lb.

For descriptive literature and a free sample — 1½ oz. (mention which grade you want) in a convenient unbreakable squeeze tube that is perfect for pinpoint applications, write on your school letterhead to Hercules Chemical Co. Inc.

(For Convenience Circle Index Code 0503)

BLACK & DECKER PORTABLE ELECTRIC DRILLS

Three new portable electric drills which obsolete all other drills of like capacity are announced by The Black & Decker Manufacturing Company. They are the new ½-in. Heavy-Duty Drill, the ⅝-in. Heavy-Duty Drill, and the ¾-in. Standard Drill. These

New ½-in. Heavy-Duty Drill

three drills feature the following exclusive developments in addition to many others:

a) Up to 130 per cent more power, so that drills maintain both torque and speed under load;

b) Three-position built-in reversing mechanism drives with equal power in both directions;

c) Positive key-drive chuck that eliminates slippage in either forward or reverse;

d) No price increase for added features and performance.

The completely new design Black & Decker-built motor in each drill delivers over 100 per cent more power in the ½-in. drills than in the previous corresponding model; over 75 per cent more power in the ⅝-in. drill; and 130 per cent more in the ¾-in. drill. Starting torque of each unit is extremely high, with 90 ft. lb. delivered in the ½-in. drill, 130 ft. lb. in the ⅝-in. drill, and 160 ft. lb. in the ¾-in. drill. A centrifugal fan ventilating system maintains a cool operating temperature even on tough jobs.

For more information on the additional

exclusive features and increased power of these new drills, write to the manufacturer.

(For Convenience Circle Index Code 0504)

THE NEW POWERMATIC PLANER

Powermatic Machine Company announces the addition of a new planer to its well-known line of woodworking machinery.

The most important feature of the new planer is the exclusive Quick-Set table roll adjustment. By means of a small lever located on the front of the unit just to the right of the table, the operator can adjust the table rolls from 0 to .040 in. The operator can now make the desired conversions within seconds. This feature alone will make the new Powermatic No. 225 Planer popular with both production plants and school shops alike.

New Powermatic Planer

The new foolproof variable feed unit installed in this planer is controlled by a large, clearly calibrated handwheel just to the right of the bed. A complete range of feeds from 20 to 100 ft. per minute is possible with true accuracy. Two Reeves variable speed pulleys, driven by a 1½ h.p. motor, make feed stalling virtually impossible.

Complete specifications and details on the 225–24-in. planer are outlined in a free illlustrated folder now available from Powermatic Machine Company.

(For Convenience Circle Index Code 0505)

FOREDOM FLEXIBLE SHAFT MACHINES

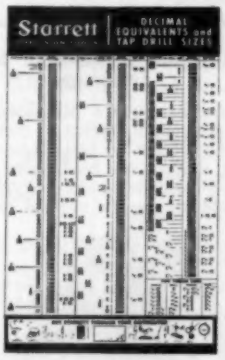
The Foredom Flexible Shaft Machines pay for themselves on "small work" jobs of grinding, finishing, deburring, etc. Their excellent featherweight, easily-controlled pencil-size handpiece promotes superior workmanship, increased production, reduced operator fatigue. Gets into "tight spots" bulkier tools cannot reach. Keeps work always well in view. Hundreds of accessories are available to grind, polish, mill, drill, debur, and sand.

For further information, or for a copy of their catalog showing bench and hang-up models for light or heavy duty, write to Foredom Electric Company.

(For Convenience Circle Index Code 0506)

READY-REFERENCE WALL CHART

The L. S. Starrett Company is offering free to school shops and industrial-arts instructors a new Ready-Reference Wall Chart, which shows at a glance decimal equivalents for all fractions including 8ths, 16ths, 32nds, and 64ths; decimal equivalents of all number and letter size drills; tap sizes and corresponding tap drill sizes and pipe thread sizes with tap drill sizes.



Starrett Ready-Reference Wall Chart

The chart is 23¼ in. wide by 37¾ in., and is printed in three colors on heavy, soil-resistant paper, tinned top and bottom with two brass hanging loops. Color is used effectively to classify this wealth of information for easy finding and large type is used for effortless, across-the-room reading.

(For Convenience Circle Index Code 0507)

INSTANT INVENTORY PANEL

Crow Electri-Craft Corporation have solved a big problem in electricity and electronics courses by supplying a new "Instant Inventory Panel" to keep the small components in student learn-by-doing kits from turning up missing.

Instant Inventory Panel

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(Continued on next page)

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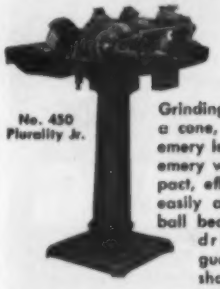

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SHOP EQUIPMENT NEWS

(Continued from previous page)

with an aluminum frame. On its front are brackets and clips for mounting all kit parts. Each part is outlined in sharp silhouette so as to call immediate attention to a missing part. The part number is also indicated.

The panel hangs on the wall or can be suspended from uprights on the workbench. It permits the teacher to take quick inventory at the end of each class period. It also makes it easy for students to find and replace components while working experiments. The same kit may be used by many classes every day.

Also available is a compact case for storing four complete Instant Inventory Panels when not in use.

(For Convenience Circle Index Code 0508)

COLUMBIAN GYRO-VISE ANGLE ADAPTER

The Columbian Vise & Mfg. Company announce a new angle adapter to permit movement of Gyro-Vises up and down in an arc. With this adapter, the vise can be placed in any position required by the user. The adapter is also said to greatly increase the already

Columbian Gyro-Vise Angle Adapter

tremendous versatility of this vise which normally operates from and rotates around a standard base. The Gyro-Vise works equally well in any upright or "on-its-side" position.

The angle adapter is one of several new features of the No. 73½ Gyro-Vise recently introduced by The Columbian Vise & Mfg. Company. Others include removable and replaceable pipe jaws, 7⅞ square inches of jaw gripping area, 3½ in. jaw width, and 1¾ in. square polished anvil surface. Weight of the angle adapter is 2¼ lb.

For details, write the Columbian Vise & Mfg. Company. Ask for Bulletin LL-3990.

(For Convenience Circle Index Code 0509)

NEW 10-CIRCUIT TRANSISTOR LAB KIT

Allied Radio Corporation, exclusive distributors of Knight-Kits, recently announced the release of their new 10-Circuit Transistor Lab Kit. Low in price and easy to assemble, this new kit offers many features of special interest to beginners and experimenters. The kit includes two transistors, all parts, and plug-in leads for building 2-stage AM radio; photoelectronic relay; wireless broadcaster; code practice oscillator; electronic switch; 2-stage audio amplifier; capacity-operated relay; electronic timer; voice-operated relay; and electronic flasher. Circuits are quickly and easily changed by merely inserting special

(Continued on page 58A)

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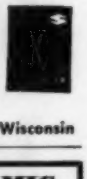

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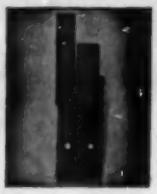

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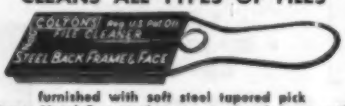

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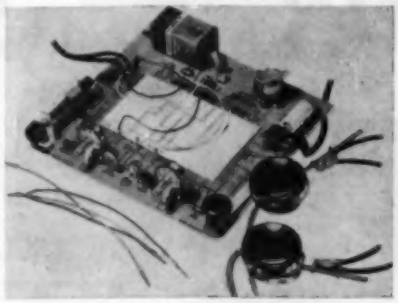
SHOP EQUIPMENT NEWS

(Continued from page 56A)



10-Circuit Transistor Lab Kit

"plug-in" leads into jacks, which are already mounted on the printed circuit board.

An instruction manual tells the kit builder exactly what to do to complete initial wiring and go from one circuit to another. Guide cards are included for placing on the printed circuit board, clearly indicating where leads are plugged in to get a working circuit.

For more complete information write to Allied Radio Corporation.

(For Convenience Circle Index Code 0510)

BROWN & SHARPE NO. 2 AUTOMATIC SCREW MACHINE

The new No. 2, automatic screw machine manufactured by the Brown & Sharpe Manufacturing Co., is available in three different capacities to take stock to ¾ in., 1¼ in., or 1½ in. diameter. For turning, forming, one-chip finishing, to 2½ in. length (3½ in. with lower driveshaft speed), the No. 2 will consistently hold limits to 0.0005 in.

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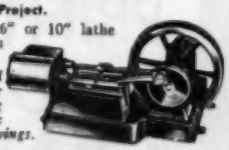

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(For Convenience Circle Index Code 0511)

NO. 48 DEEP REACH CLAMP

The Cincinnati Tool Company have made available a new No. 48 Deep Clamp to fill a growing demand for a strong deep clamp. It features a forged steel heat-treated frame and large diameter full length screw with forged wing to insure strength and durability. All sizes are individually power-tested.

No. 48 Deep Reach Clamp

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For more information on this No. 48 Forged Steel Superclamp, or other clamps, write to the manufacturer.

(For Convenience Circle Index Code 0512)

COMBINATION STAKE AND MACHINE BENCH

Parent Metal Products, Inc., have introduced their new combination stake and machine bench No. 96-45-412BLSM. This combination bench is 96 by 45 in. It is 31¼ in. high. The top is select edge grain maple, 2¼ in. thick, with front and back edges protected by angle irons. The top is equipped with two

Combination Stake and Machine Bench

stake plates, each 30 in. wide and 8 in. deep. The base is equipped with twelve box lockers (six back-to-back), two steel tubular bench legs, and two 30-in. deep shelves. The box lockers are each 12 in. wide, 21 in. deep, and 15 in. high. The doors have spring hinges and padlock attachments.

A complete Industrial Arts and Vocational Shop Equipment Catalog is available.

(For Convenience Circle Index Code 0513)

NEW STACOR BLUEPRINT FILES

The Stacor Equipment Company have introduced the new Stacor line of "Inter-Member" blueprint files designed to meet the General Services Administration requirement that all units shall interlock and intermember with existing units. This means that "Inter-Member" files will interlock and intermember with many standard cabinets of other manufacturers, now in use throughout industry. "Inter-Member" files are designed, constructed, and finished to meet all government specifications.

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(Continued on next page)

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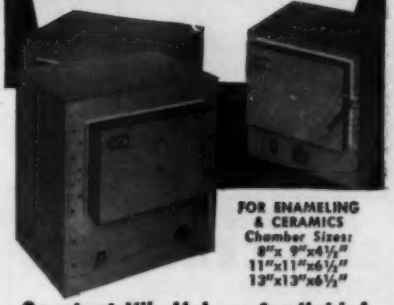

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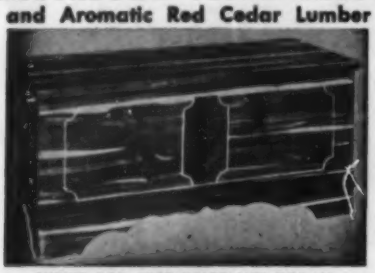

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SHOP EQUIPMENT NEWS

(Continued from previous page)

New Stacor Blueprint Files

tracings, electrotypes, boards, or swatches. Coated-fabric covers flatten sheets to keep them from curling and completely protect them from dust and dirt. Reinforced drawer front construction makes drawers rigid and keeps pulls firmly anchored. Drawers are prepunched for dividers, and roll on case-hardened ball bearings, and won't pull out accidentally. The finish is green or gray hard-baked enamel, with attractive hardware.

Prices and further information are available from Stacor Equipment Company.

(For Convenience Circle Index Code 0514)

RINSE AWAY PAINT AND VARNISH REMOVER

Pittsburgh Plate Glass Company have announced their newly developed paint remover that is easy to apply with an ordinary paint brush, and which removes stubborn coats of paint, varnish, and lacquer from wood and metal by simply directing a strong spray of water on the coated surface. This product, known as "Rinse Away Paint and Varnish Remover," leaves no residue of any kind to interfere with drying of subsequent paint coatings.

Paint may be washed away within 15 to 30 minutes after application of this remover, leaving a bright, clean surface that needs no treatment of any kind before repainting.

The new remover is noninflammable and in addition to removing surface paint, may be used as a cleanser in reconditioning old bristle and nylon paint brushes.

The product will be packaged in pint, quart, and gallon containers, and is available from dealers who handle Pittsburgh Plate Glass products.

(For Convenience Circle Index Code 0515)

If you want to prevent the "bleeding" of old paint or stain from streaking through new paint, apply a thinned coat of fresh, white shellac. The shellac acts as a sealer. Then put on your new color. — *Shellac Information Bureau.*

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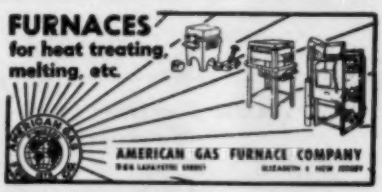

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52	510	518	526	534	542	550	558	566	574	582	589	596	5103	5110	5117									
53	511	519	527	535	543	551	559	567	575	583	590	597	5104	5111	5118									
54	512	520	528	536	544	552	560	568	576	584	591	598	5105	5112	5119									
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55	513	521	529	537	545	553	561	569	577	585	592	599	5106	5113	5120									
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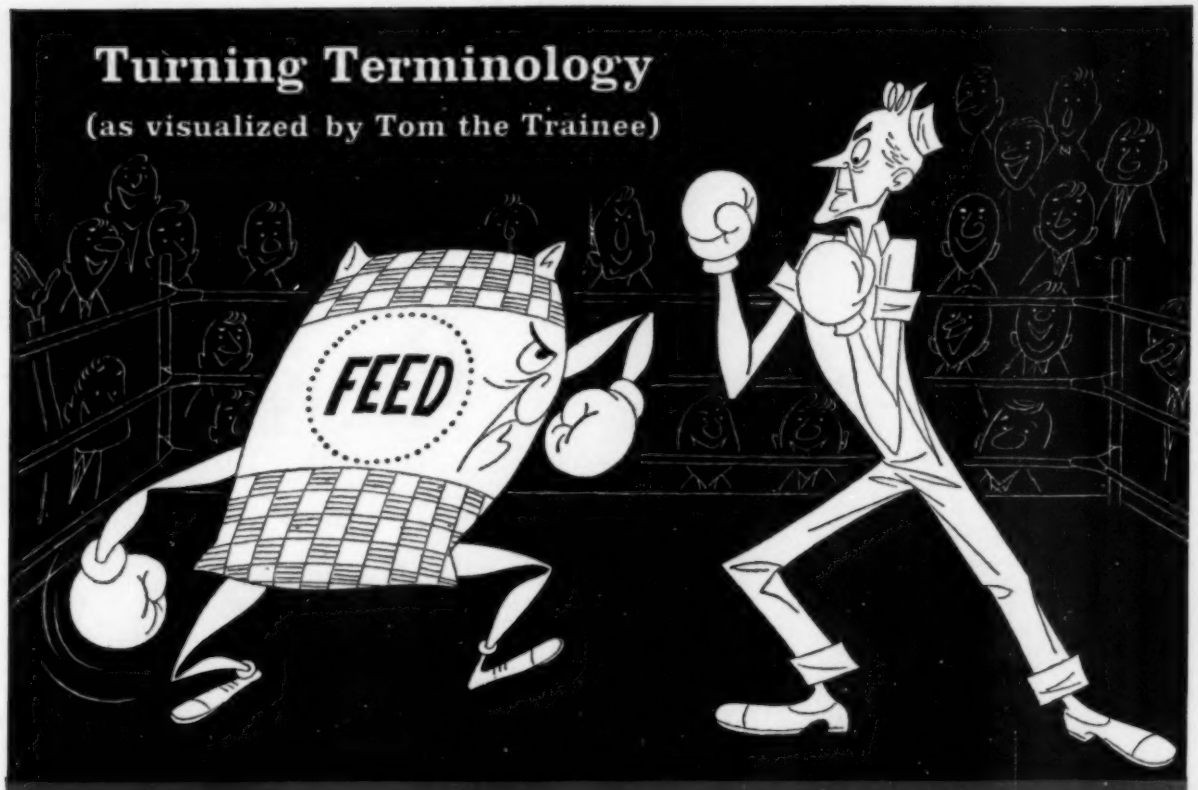
(as visualized by Tom the Trainee)



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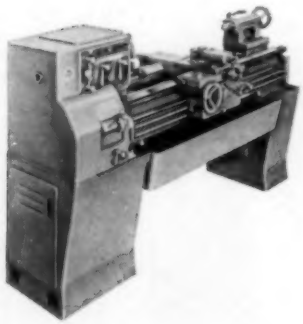

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